SUPERFUND

PROPOSED PLAN

Keddy Mill Superfund Site
Windham, ME

U.S. EPA | HAZARDOUS WASTE PROGRAM AT EPA NEW ENGLAND

THE SUPERFUND PROGRAM protects human health and the environment by locating, investigating, and cleaning up abandoned hazardous waste sites and engaging communities throughout the process. Many of these sites are complex and need long-term cleanup actions. Those responsible for contamination are held liable for cleanup costs. EPA strives to return previously contaminated land and ground-water to productive use.

YOUR OPINION COUNTS: OPPORTUNITIES TO COMMENT

EPA will be accepting public comments on this proposed cleanup plan from June 28, 2023 through July 28, 2023. EPA is seeking input on all of the alternatives and the rationale for the preferred alternative. Additionally, new information or public input that EPA learns during the public comment period could result in the selection of a final remedial action that differs from the preferred alternative. You do not have to be a technical expert to comment. If you have a concern, suggestion, or preference regarding this Proposed Plan, EPA wants to hear from you before making a final decision on how to protect your community. In compliance with certain statutory requirements, EPA is specifically requesting public comment concerning its wetland and floodplain findings and its draft finding regarding the proposed management and cleanup of polychlorinated biphenyls (PCBs). Comments can be sent by mail, email, or fax. People also can offer oral or written comments at the formal public hearing (see Page 26 for details). If you have specific participation needs for the public meetings and hearing, questions about the facility and its accessibility, or questions on how to comment, please contact Charlotte Gray.

Public Informational Meeting
June 27, 2023 6:00 p.m. to 7:30 p.m.

Formal Public Hearing
July 18, 2023 6:00 p.m.

Both meetings at:
Windham Fire Station – District 1
33 Main Street
Windham, ME 04062
Find virtual meeting links:
www.epa.gov/superfund/keddy

CLEANUP PROPOSAL SNAPSHOT

The Proposed Plan for the cleanup of the Keddy Mill Superfund Site (the Site) in Windham Maine, which is to be implemented following the substantial completion of

continued >>

KEY CONTACTS:

JEFFRY SAUNDERS
U.S. EPA
Remedial Project Manager
617-918-1352
saunders.jeffry@epa.gov

CHARLOTTE GRAY
U.S. EPA
Community Involvement Coordinator
617-918-1243
gray.charlotte@epa.gov

TESS SWIECANSKI
Maine Department of Environmental Protection
Project Coordinator
(207) 816-0112
tess.swiecanski@maine.gov

GENERAL INFO:

EPA NEW ENGLAND
(617) 918-1111
www.epa.gov/region1

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an EPA-authorized Non-Time-Critical Removal Action (NTCRA) to demolish the mill complex and associated structures, generally includes the following components:

- Excavation and off-site disposal of approximately 22,000 cubic yards of contaminated soil/debris from the Mill Complex Property (Figures 1 and 2);
- Targeted treatment of soil excavations with amendments in support of groundwater cleanup;
- *In situ* (in place) treatment of groundwater to reduce the mass, mobility and toxicity of contaminants;
- Excavation and off-site disposal of approximately 320 cubic yards of contaminated sediments from the Target Reach of the Presumpscot River[1];
- Restoration of the portions of the Presumpscot River riverbed, riverbank, wetland and floodplain habitat altered by the remedial action;
- Land use restrictions (called "Institutional Controls" or ICs) to prevent exposure to Site-related contaminants in groundwater and fish tissue until cleanup levels are met;
- Inspections to evaluate Site restoration and stabilization activities, as well as limited operation and maintenance (O&M);
- Monitoring of groundwater and fish tissue to evaluate the achievement of cleanup levels; and
- Periodic reviews, at a minimum of every five years, to assess the protectiveness of the remedy.

The proposed remedy is estimated to cost approximately $17 million and estimated to take approximately 2 to 4 years to design and implement. Soil cleanup levels are anticipated to be achieved upon completion of the excavation activities. Sediment is estimated to achieve ecological cleanup levels upon completion of the excavation activities; however, it will take more time for the sediment removal to result in the reduction of contamination in fish tissue to below human consumption risk levels (approximately 14 years after the sediment removal). Groundwater is estimated to achieve cleanup levels following implementation of *in situ* treatment and attenuation of groundwater geochemistry to ambient conditions (in approximately 12 years). The performance of the remedy will be assessed at least every 5 years to evaluate the protectiveness of the remedy until all cleanup levels are achieved. A more detailed description of this proposal is outlined below and in the Feasibility Study (FS) Report dated June 2023, available in the Administrative Record (see below).

In accordance with Section 117 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the law that established the Superfund program, this document summarizes EPA's cleanup proposal. For detailed information on the cleanup options evaluated for use at the Site, see the Keddy Mill Superfund Site Feasibility Study and other documents contained in the site's Administrative Record available for review online at www.epa.gov/superfund/keddy *or at the Site information repositories at the Windham Public Library, 217 Windham Center Road, Windham, Maine and at the EPA New England Records Center, 5 Post Office Sq., First Floor, Boston, MA.*

A CLOSER LOOK AT EPA'S PROPOSED CLEANUP APPROACH

The Remedial Investigation Report dated November 2021, available in the Administrative Record (see below), summarizes the nature and extent of contamination at the Site and was used to prepare the FS which identified all of the cleanup options (also called "alternatives") EPA considered for the proposed cleanup. The FS evaluated

[1] The Target Reach of the Presumpscot River represents the segment of the river between the downstream side of the Little Falls Dam and the upstream side of the Mallison Falls Dam.

the efficacy of different combinations of alternatives to restrict access to, contain, remove, and/or treat contamination to protect human health and the environment by preventing unacceptable risk of exposure from Site-related contaminants in soil, groundwater, sediment and fish tissue.

Based upon the alternatives evaluated in the FS and pending completion of the NTCRA to demolish the mill complex and associated structures, EPA is proposing the following long-term cleanup approach for the Keddy Mill Superfund Site:

Soil within Mill Complex Property

EPA's preferred alternative for soil within the footprint of the Mill Complex Property is **Alternative SO-3 – Excavation and Off-Site Disposal**, as described in the FS, which includes the following source control components:

- Pre-design investigation to further define the horizontal and vertical extents of Site-related soil/debris contamination;
- For work within the 500-year floodplain of the river, implementing floodplain mitigation measures (as needed) prior to initiating soil removal actions;
- Excavation of approximately 22,000 cubic yards of contaminated soil/debris with concentrations in excess of proposed cleanup levels (Figure 3);
- Site management including erosion controls measures, dust control and air monitoring, and excavation shoring as necessary during excavation activities;
- Off-site disposal of excavated soil/debris at appropriately permitted facilities depending on the nature and levels of contamination in the soil/debris. For soil/debris contaminated with PCBs with *in situ* total PCB concentrations equal or greater than 50 milligrams per kilogram (mg/kg), the waste will need to be sent to a permitted Toxic Substances Control Act (TSCA) disposal facility;
- Dewatering of any excavated saturated soils and removal of any water accumulating in excavations will require management, treatment (as needed) and appropriate discharge of water under applicable discharge standards (depending on the selected discharge location);
- Placement of treatment amendments in targeted open excavations in support of the selected groundwater remedy (as described below);
- Grading in a manner that improves drainage and addresses current erosion and contaminant migration; and
- Restoration of excavation areas, including altered wetland/floodplain habitat, with documented clean, imported backfill to grade and re-vegetate with native vegetation to control erosion.

Contamination that has been identified in adjacent, off-site properties, beyond the southern boundary of the Mill Complex Property, is being managed under separate State authority and oversight.

Groundwater

EPA's preferred alternative for groundwater is **Alternative GW-3 – *In Situ* Treatment and Institutional Controls** as described in the FS. The preferred groundwater alternative assumes that implementation will occur following the soil source control action and includes the following components:

- Baseline groundwater sampling prior to the completion of the soil source control action (which may require installing additional monitoring wells);
- Pre-design investigation to assist in the assessment and selection of appropriate treatment technologies based on Site-specific conditions following implementation of the soil source control action;

- Bench-scale treatability study to identify the appropriate reagents to address contaminants in groundwater;
- *In situ* chemical treatment of groundwater via reagent injection in overburden groundwater exceeding proposed cleanup levels (Figure 4);
- Post-treatment monitoring of groundwater to assess the effectiveness of the treatment approach and determine if further *in situ* treatment (overburden and/or bedrock groundwater) is warranted;
- Implementation of ICs to prevent exposure to groundwater vapors and use of groundwater until groundwater cleanup levels are met;
- Monitoring to evaluate stabilization of groundwater to natural geochemical conditions following treatment until cleanup levels are achieved (which may require additional maintenance or replacement of monitoring wells); and
- Periodic reviews, at a minimum of every 5 years, to assess the protectiveness of the remedy until cleanup levels are achieved.

Sediments in the Target Reach of the Presumpscot River

EPA's preferred alternative for sediment is **Alternative SED-3B – Mechanical Excavation and Off-Site Disposal**, as described in the FS. The preferred sediment alternative assumes implementation will occur following the soil source control action and includes the following components:

- Pre-design investigation to further define the horizontal and vertical extents of Site-related sediment contamination;
- Implementing floodplain mitigation measures (as needed) prior to initiating sediment removal actions;
- Temporarily enclosing limited areas of the river along the eastern bank with a temporary dam or other structure, dewatering the enclosed area and discharging the water back to the river to allow access to contaminated sediments under dry conditions (Figure 5);
- Excavation of approximately 320 cubic yards of contaminated sediment with concentrations in excess of proposed cleanup levels;
- Sediment dewatering and management, treatment (as needed) and appropriate discharge of water from the excavated materials;
- Off-site disposal of all excavated sediment at appropriately permitted facilities;
- Restoration of riverbed sediment excavation areas with documented clean, imported backfill to grade and revegetation of the altered riverbank (*e.g.*, staging areas, temporary access road, etc.) with native species;
- Inspection and maintenance of revegetated areas until the Site is stabilized;
- ICs to prevent exposure to contaminated fish tissue until cleanup levels are achieved and there no longer is an unacceptable human consumption risk from eating the fish;
- Monitoring of fish tissue following implementation of the sediment remedy to evaluate the achievement of proposed human health cleanup levels for fish consumption. Approximately 14 years after the sediment removal the subsequent generations of fish are expected to have significantly less exposure to any remnant Site contamination than the current populations; and
- Periodic reviews, at a minimum of every 5 years, to assess the protectiveness of the remedy until fish consumption risk standards have been achieved.

Estimated Cost

The estimated total present value[2] of this proposed cleanup approach, including construction, operation and maintenance, and long-term monitoring is approximately $17,008,000. Each component of the proposed cleanup approach is outlined below and is discussed in the FS in greater detail.

Potential Community Impacts

Impacts to the community are expected to be limited, but design and implementation of the remedy will require communication and coordination with various stakeholders (*e.g.*, Town of Windham [the Town], surrounding community and landowners, utility companies, *etc.*). Short-term impacts to the community and Site workers include the potential inhalation of airborne contaminants during implementation of the excavation of soil and sediment and associated management activities. The minor risks to workers and the community would be temporary and mitigated through the implementation of dust control measures (e.g., water sprays, truck and stockpile covers, etc.) and perimeter air monitoring during activities associated with soil and sediment handling and management. Access to the work area(s) will be restricted to Site workers and authorized personnel only. The potential for localized releases of vapors during excavation are not anticipated to impact the community and will be mitigated for Site workers during remedial actions through proper health and safety precautions (*e.g.*, personal protective equipment, proper health & safety procedures, etc.).

Other impacts to the community include the trucking of supplies and materials to/from the Site. Material (primarily soil/debris and sediment) that is transported off-site for disposal and on-site for backfilling/restoration would take approximately 1,500 total truckloads to transport (assumes 30 cubic yard dump trailers). Vehicles accessing the Site are anticipated to use the existing entrance; however, enhanced vehicle access is anticipated to be necessary to facilitate movement of construction equipment. EPA will work with Town officials to determine the best access locations and routes to and from the Site to minimize any traffic concerns. The cleanup work will be performed during typical work hours to minimize noise in nearby residential areas.

On-site groundwater use restrictions are expected to be in place until cleanup levels are achieved in approximately 12 years. Restrictions to prevent consumption of fish from the Target Reach of the Presumpscot River are also expected to be in place until fish tissue cleanup levels are achieved in approximately 11 years.

Overall, the preferred cleanup approach is expected to take 2 to 4 years to design and implement.

EPA IS ASKING FOR PUBLIC COMMENT ON THE FOLLOWING PROPOSED DETERMINATIONS:

Wetland Impacts

Section 404 of the Clean Water Act (CWA) requires a determination, when circumstances necessitate, that there is no practicable alternative to taking federal actions in waters of the United States, including wetlands, and that EPA's selected alternative is the "Least Environmentally Damaging Practicable Alternative" (LEDPA). Should there be no alternative that can avoid taking an action, the federal actions should minimize the destruction, loss, or degradation of these resources and preserve and enhance their natural and beneficial values. EPA has determined that, due to the presence of Site-related contamination, there is no practicable alternative to conducting work in protected aquatic habitats and limited portions of emergent wetlands. As required by the CWA, EPA has determined, through its analysis of the various alternatives, that the proposed cleanup alternatives which impact wetland and natural resource areas meet the LEDPA standards for protecting such resources. EPA will minimize potential harm and avoid adverse impacts to protected aquatic habitats and wetlands by using best management practices and by restoring or mitigating these areas consistent with federal and state wetlands protection laws. Any aquatic habitats or wetlands affected by remedial work will be restored

[2] "Present value" is the amount of money set aside today to ensure that enough money is available over the expected life of the project, assuming certain economic conditions (e.g., inflation).

with clean, imported materials and native vegetation consistent with pre-remediation conditions and such restoration will be monitored until the vegetation becomes re-established. Other mitigation measures will be used to protect wildlife and aquatic life during remediation and restoration, as necessary.

Federal regulations at 44 C.F.R. Part 9, implementing wetland protection requirements under Executive Order 11990, require EPA to specifically solicit public comment on its proposal to impact federal jurisdictional wetlands. Through this Proposed Plan EPA is asking the public to provide the Agency its comments on the Agency's plan for protecting wetland resources.

The State Natural Resources Protection Act – Wetlands and Waterbodies Protection Rules (Chapter 310) includes jurisdiction over areas in, on, over or adjacent to State regulated wetlands and waterbodies. Under the State standards the area within 75-feet, measured horizontally, of the normal high-water line of a great pond, river, stream or brook or the upland edge of a coastal wetland or freshwater wetland is also regulated. Work within areas within 75-feet of the Presumpscot River and any State-regulated wetlands (approximately 0.78-miles of emergent wetland vegetation along the river shoreline) will be conducted to protect State-regulated natural resources, as described above relative to federal wetland protection requirements.

Floodplain Impacts

Before EPA can select such a cleanup alternative, federal regulations at 44 C.F.R. Part 9, implementing requirements under Executive Order 11988 (Floodplain Management), requires EPA to make a determination that there is no practicable alternative to temporary activities that affect or result in the occupancy and modification of the 100- and 500-year floodplain. Through its analysis of alternatives, EPA has determined that the proposed cleanup will cause temporary impacts but will not result in the permanent occupancy and modification of floodplains.

The westernmost portion of the Site is located in the mapped 100-year floodplain. The Federal Emergency Management Agency (FEMA) did not identify any 500-year floodplain at the Site; however, EPA conducted an evaluation of the flood hazard zones at and in the vicinity of the Site. EPA concluded that control of the Little Falls dam and the elevation and control of the Mallison Falls dam limit how high the Presumpscot River stage can rise within the Target Reach. As a result, flooding beyond the 100-year floodplain boundaries is unlikely and the 500-year floodplain boundary at the Site is presumed to be consistent with the 100-year floodplain.

EPA will avoid or minimize potential harmful temporary impacts on floodplain resources within the river and its 100- and 500-year floodplain to the extent practical at the cleanup areas to protect on-site and downstream floodplain resources. While excavation and backfilling with clean soil is proposed for portions of the Mill Complex Property located in floodplains (Alternative SO-3), only temporary impacts to the floodplains are anticipated. Waste located within the floodplain will be excavated and backfilled with clean, imported fill and restored to grade so that the current flood storage capacity of these areas will not be diminished after completion of the remedial actions. Temporary mitigation measures, if required, will be implemented prior to initiation of the excavation activities to address any short-term floodplain impacts.

Treatment injections associated with the preferred groundwater alternative (Alternative GW-3) are also anticipated to be associated with temporary impacts to the floodplain. Best management practices will be used during construction, which include erosion control measures, proper regrading, and restoration and monitoring of impacted areas.

The sediment alternative will involve temporarily enclosing limited areas of the river, dewatering the enclosed area and discharging the water back to the river to provide access for the sediment excavation. Based on the limited size of the sediment excavation areas (Figure 5), management of river volume within the Target Reach by the Little Falls and Mallison Falls dams, and anticipated flow rate and volume of water to be discharged to isolate the riverbed for excavation purposes, no impacts to downstream floodplain receptors are anticipated. However,

flood mitigation measures will be implemented (as needed) prior to the placement of temporary riverbed enclosures and dewatering.

The 44 C.F.R. Part 9 regulations also require EPA to specifically solicit public comment on its proposal to impact floodplain resources. Through this Proposed Plan EPA is asking the public to provide the Agency its comments on the Agency's plan for protecting floodplain resources during the implementation of the remedial action. No long-term floodplain impacts are proposed.

Proposed Draft Determination: PCB Cleanup Level is Protective

EPA has determined that soil within the Mill Complex Property contaminated with total PCB concentrations of 1 mg/kg or greater, sediments within the Target Reach at total PCB concentrations of 0.7 mg/kg or greater, and PCBs at 0.5 micrograms per liter (µg/L) in Site groundwater meet the definition of a *PCB Remediation Waste* as defined under 40 CFR § 761.3. Therefore, these PCB-contaminated soils, sediments, and groundwater are regulated for cleanup and disposal under 40 CFR § 761 (*Polychlorinated Biphenyls Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions*). Under 40 CFR § 761.61(c), EPA may authorize disposal of PCBs in a manner not otherwise prescribed provided that EPA determines that the disposal will not pose an unreasonable risk of injury to health or the environment. Risks from unrestricted exposure to PCBs in soil/debris and sediment (inclusive of fish consumption risks) will be addressed through excavation and off-site disposal. The physical removal of soil/debris and associated amendment application, followed by *in situ* treatment of residual contamination in groundwater, will mitigate the mobilization of PCBs to the shallow groundwater. The selected *in situ* treatment technology and subsequent attenuation to natural geochemical conditions is anticipated to further address residual PCBs in groundwater. ICs will limit potential exposure to groundwater and fish tissue until cleanup levels are achieved.

EPA has made a draft finding that the proposed remediation of PCB contaminated soil, sediment (to also address PCB fish consumption risks), and groundwater as set out in the Proposed Plan does not result in an unreasonable risk of injury to health or the environment as long as certain conditions are met. EPA's draft TSCA Determination, which documents the required conditions related to PCBs, is included in the Administrative Record available online www.epa.gov/superfund/keddy. A final TSCA Determination will be made after considering all public comments received during the public comment period with the final Determination published with the Record of Decision.

BACKGROUND

Site Description

The Site consists of a 6.93-acre abandoned mill complex property, located at 7 Depot Street (the Mill Complex Property), an adjacent reach of the Presumpscot River, and associated riparian properties (collectively, the Site) located in Windham, Cumberland County, Maine (Figure 1). The Mill Complex Property is in a mixed commercial/residential area in the village of South Windham. The Mill Complex Property is bounded to the north by Depot Street with commercial and residential properties beyond; to the immediate northeast by a multi-unit apartment complex; to the east by a former Maine Central Railroad right-of-way; to the south and southwest by an undeveloped property referred to herein as the Transmission Line Property; to the south-southwest by the Presumpscot River; to the west by a property that includes a dam and a hydroelectric power generating station (referred to herein as the "Hydro Property"); and to the northwest by a multi-unit senior housing complex (Little Falls Landing). The Mill Complex Property was historically part of a larger property that included portions of several of the abutting properties.

The central portion of the Site, where the mill complex is situated adjacent to/over the Presumpscot River, is relatively level and is bounded by steeper terrain to the north, east, and west. The Mill Complex Property is currently vacant and a chain-link fence restricts access the northern portion of the parcel as well as into the mill buildings. Trespassers have periodically entered and damaged portions of the mill complex. The abandoned mill complex currently includes several connected buildings; however, the function and configuration of the buildings

has changed over time. The Site lies on the northern and eastern side of the Presumpscot River, adjacent to the Little Falls Dam and approximately ½ mile upstream of the Mallison Falls Dam. A segment of the river flows beneath the western portion of the mill complex.

As noted above, the NTCRA has been authorized, but not yet implemented, to expedite a limited cleanup action of PCB contamination and asbestos-containing material (ACM) through the demolition and removal of the mill complex and associated mill building materials. Risks associated with the structure are to be addressed as part of the NTCRA.

Site History

Mills were established on both sides of the Little Falls portion of the Presumpscot River as early as the 1750s, with a sawmill built on the north side of the river (*i.e.*, general vicinity of the Site) sometime before 1756. After the sawmill ceased operations in 1822, the mill site was unoccupied except for two small buildings used as a grist mill and carding mill. By the 1870s, the mill site was vacant. In 1875, the Sebago Wood Board Company acquired the mill site and constructed a pulp mill complex, which included a three-story main mill building, machine room, drying rooms, a wood preparing house, and a 100-foot external chimney. Between the late 1800s and 1922, additional process buildings/facilities were added including storehouses, a railroad siding, a finishing and shipping building, a water tank, a machine room, and an engine room. The mill was used for pulp and box-board manufacturing through the 1940s.

By 1945, the complex shifted from manufacturing paper to steel products (*e.g.*, heavy equipment buckets). Scrap metal was transported by rail cars to the mill and melted into steel billets, which were then used to manufacture steel parts. During the 1960s and early 1970s, manufacturing included flanges and fire suppression materials. It was during this period that disposal of hazardous substances, including PCBs, may have occurred at the Site. A large oil-based fire in late 1969 heavily damaged the mill complex and destroyed several blast furnaces. Several incidents of smaller fires within the mill complex also occurred between 1969 and 1997. Between 1973 through 1974, heavy machinery in the mill complex were removed from the property, which suggests fabrication of metal parts likely ended by 1973 or earlier. In 1974, a scrap recycler began operations in the mill building. Minimal records were located regarding the Site's use through 1997; however, the property appeared to be lightly used as a machine shop and for equipment storage.

CURRENT AND FUTURE LAND USE

The Site properties are currently unoccupied. The Mill Complex Property, which constitutes the majority of the Site (Figure 2), is zoned by the Town as part of a Village Commercial (VC) district and is in the Shoreland General Development (GD) district zone. Per Section 400 (Zoning Districts) of the Town's Land Use Ordinance, the VC zoning allows for multiple uses including: residential, childcare, senior housing, commercial facilities, restaurants, and recreational facilities. The Shoreland Zoning District was previously rezoned from an Industrial Zone designation by contract between the Town and the Village at Little Falls, LLC. The Village at Little Falls Contract Zone (VLF) was established in June 2005 to amend the area's zoning from industrial to multi-unit residential. Recent EPA discussions with town officials in January 2022 and July 2022 confirmed a significant interest in the future use of the Mill Complex Property, including potential mixed residential, recreational and retail/commercial use.

Site-related contamination has also come to be located within a limited riparian portion of the Transmission Line Property, which encompasses submerged portions of the Presumpscot River up to the mean high water level. The parcel is currently owned by Presumpscot Hydro LLC, a wholly owned subsidiary of Dichotomy Power Maine LLC. Prior to November 2022, this parcel, as well as the Hydro Property, were owned by S.D. Warren Company (dba Sappi Fine Paper North America [Sappi]).

This section of the river shoreline is not open to the public, although there are no physical restrictions on trespassing. A State Environmental Covenant, applicable to both the Hydro and Transmission Line Properties, was executed on November 10, 2015. The perpetual activity and use limitations generally include restrictions on the extraction of

groundwater, excavation activities, and uses other than ongoing utility purposes. It is anticipated that the terrestrial portion of the Transmission Line Property (*i.e.*, upland areas exclusive of Presumpscot River sediments up to the mean high water level being remediated under Superfund), will continue to be managed and adequately remediated under State authority and oversight.

All groundwater in Maine is classified as not less than Class GW-A, which is suitable for use as a public water supply. While there are currently no private wells at or located downgradient of the Site, the remedial alternatives were evaluated based on a need to a need to achieve federal drinking water standards that constitute the beneficial use standard for groundwater beneath the Site.

The Site is located adjacent to and within the Target Reach of the Presumpscot River, which begins at the outlet of Sebago Lake and flows through the Towns of Standish, Gorham, Windham, Westbrook, Falmouth, and Portland before draining into Casco Bay. The Presumpscot River is approximately 24 miles long and drains an area of approximately 615 square miles. The Presumpscot River provides recreational benefits to the surrounding communities and there is local interest in enhanced river recreation and public access for activities such as fishing, boating, walking and hiking in/along the Target Reach.

Environmental Investigations and Cleanup Actions

Keddy Mill Superfund Site Timeline[3]	
1993	Phase I Limited Environmental Assessment conducted by property owner to document past operational activities and product use; concluded that contaminated soil was potentially present.
1994	Phase I Environmental Site Assessment conducted by property owner consisting primarily of a public information search, site reconnaissance, and interviews.
	Site Inspection conducted by MEDEP following observation of fuel oil in a stormwater culvert on Depot Street; eleven above-ground storage tanks (ASTs) identified.
1999	Phase I and Phase II Environmental Site Assessment led to excavation of 10.88 tons of petroleum-contaminated soil by the property owner; overseen by the State. Other potential contaminant sources including fuel storage tanks, lubricants, solvents and heavy metals.
2004	Supplemental Site Investigation by prospective property developers identified the apparent presence of PCBs in soil in excess of TSCA cleanup levels.
2005	30 to 40 gallons of PCB-containing fluid released from vandalized electrical equipment in mill building. Prospective property developer cleaned up spill; overseen by MEDEP.
2007	Geotechnical investigation conducted by a prospective developer.
2008-2009	Supplemental geotechnical investigation completed by a prospective property developer.
2010	In coordination with MEDEP, the Town expended EPA Brownfields Assessment grant funding to conduct further characterization of PCB contamination throughout the Mill Complex Property.
2011	Supplemental Investigation conducted by the Town in coordination with MEDEP to further delineate PCB contamination and identify contaminant sources.
2012	CERCLA Preliminary Assessment performed by EPA's Superfund Technical Assessment & Response Team (START) contractor.
2013	CERCLA Site Inspection (SI) completed by EPA's support contractor. Information collected during the SI was used to score the Site under the CERCLA Hazard Ranking System (HRS).
	Site proposed for listing on the National Priorities List (NPL).
2014	Site added to the NPL.
2015-2019	EPA's Remedial Investigation (RI) data collection iteratively completed.
2018–2021	Human Health Risk Assessment (HHRA) developed and refined.
2018-2023	Draft Screening Level Ecological Risk Assessment (SLERA) developed and refined.
2019–2021	Draft RI Report developed.
2022	EPA-authorized NTCRA to demolish the mill complex; required to facilitate permanent remedy.

[3] Timeline limited to primarily pre-Superfund investigations/cleanup of petroleum and PCBs and EPA's remedial process. Detailed information associated with the implementation of the NTCRA is available in EPA's removal action Administrative Record (www.epa.gov/superfund/keddy)

Keddy Mill Superfund Site Timeline[3]	
2022-2023	Draft FS Report developed.
2023	EPA releases proposed cleanup plan.

WHY CLEANUP IS NEEDED

EPA has determined that there are both current and future potential threats to human health and the environment at the Site due to historical manufacturing and industrial activities (*e.g.*, mill wastes, spills, *etc.*), primarily within the Mill Complex Property. Exclusive of the mill complex structure, the removal of which will be addressed through the implementation of the NTCRA, contaminants of concern (COCs) at the Site were primarily released to soil. Due to the Site's topography and surface water drainage directed onto the Mill Complex Property from off-site locations, stormwater actively migrates through and pools within areas north of the mill complex. Stormwater further migrates through the dilapidated mill structure, resulting in discharge to the Target Reach of the Presumpscot River. Contaminants in soil are mobilized via stormwater flow and have migrated to Target Reach sediments. Sediment contamination (specifically PCBs) has further migrated to Target Reach fish via food-chain exposures and bioaccumulation (*i.e.*, become concentrated within the body) in fish tissue. PCBs build up in the fatty tissues of fish and other animals.

Contaminants in soil have also migrated into subsurface soil and into bedrock, contaminating groundwater in the overburden and, to a limited degree, in bedrock beneath the Site. Groundwater is understood to discharge to the river.

Site Contaminants

The primary COCs at the Site include, but are not limited to the following:

Dioxins/Furans and Dioxin-like PCBs: Dioxins/furans are a family of chemicals that are primarily created when other chemicals or products are made (*i.e.*, dioxins furans are not intentionally produced) including in the pulp and paper industry. The most well-known chemical is 2,3,7,8-Tetrachlorodibenzo-p-Dioxin (2,3,7,8-TCDD). Dioxin-like PCBs have a similar toxicity and share chemical characteristics with dioxins/furans. Dioxins/furans and dioxin-like PCBs are primarily present in soil and groundwater at the Site.

Metals and Cyanide: Metals are minerals that naturally occur in the Earth's crust and vary based on local geology. Human activities and land disturbance can redistribute or concentrate metals in areas where they may not have been present or mobilize metals (*e.g.*, dissolving them into groundwater). While some metals are essential as nutrients, all metals can be toxic at some level. Cyanides are sorbed by various natural media, including clays, biological solids, and sediments. Metals present at the Site include antimony, arsenic, cyanide, iron, manganese. These metals were primarily found in soil and/or groundwater at the Site.

Polychlorinated Biphenyls (PCBs): PCBs are manmade chemicals that were used in electrical manufacturing and were banned in 1979. They are persistent in the environment, meaning they do not readily degrade and are known to bioaccumulate. PCBs are present primarily in soil, sediment, groundwater, and fish tissue at the Site.

Volatile Organic Compounds (VOCs): Include a variety of chemicals which are used as ingredients in many products and materials such as glue, paint, and solvents. Volatile organic compounds, or VOCs, are organic chemical compounds that easily evaporate. VOCs found in soil and groundwater at the Site include trichloroethene (TCE), chloroform, 1,4-dichlorobenzene and vinyl chloride.

Semivolatile Organic Compounds (SVOCs): SVOCs are chemicals that tend to have a higher molecular weight and boiling point than VOCs. Bis(2-ethylhexyl)phthalate and pentachlorophenol are present primarily in groundwater at the Site.

Polycyclic Aromatic Hydrocarbons (PAHs): PAHs are a subgroup of SVOCs formed during the incomplete burning of coal, oil and gas, garbage, and other organic substances like tobacco or charbroiled meat. Several Site-related PAHs, including benzo(a)pyrene, chrysene, dibenz(a,h)anthracene, naphthalene and 2-methylnaphthalene were detected primarily in soil and/or groundwater.

How is Risk to People Expressed?

Every person has a baseline (non-site related) risk for cancer and non-cancer health effects to occur. For example, the American Cancer Society estimates that 1 in 2 men, and 1 in 3 women, will develop cancer over a lifetime (Cancer Facts and Figures for 2020, American Cancer Society). While people also have baseline risk from non-cancer health effects, these adverse effects are organ-specific and cannot be expressed in terms of probability.

In evaluating chemical exposure risk to humans, estimates for risk from carcinogens and non-carcinogens (chemicals that may cause adverse effects other than cancer) are expressed differently. EPA also considers the cumulative carcinogenic and non-carcinogenic effects when multiple chemical exposures with similar target endpoints are present.

For carcinogens, risk estimates are expressed in terms of probability. For example, exposure to a particular site-related carcinogenic chemical may present a 1 in 1,000,000 increased chance of causing cancer over an estimated lifetime of 70 years. This can also be expressed as one-in-a-million or 1×10^{-6} excess lifetime cancer risk. The EPA acceptable risk range for carcinogens is 1×10^{-6} (1 in 1,000,000) to 1×10^{-4} (1 in 10,000) over a 70-year lifetime. In general, site-related risks higher than this range would require consideration of cleanup alternatives.

For non-carcinogens, exposures are first estimated and then compared to a reference dose (RfD). RfDs are developed by EPA scientists to estimate the amount of a chemical a person (including the most sensitive person) could be exposed to over a lifetime without an appreciable risk of developing adverse health effects. The exposure dose is divided by the RfD to calculate the ratio known as a hazard quotient (HQ) to determine whether non-cancer adverse health effects would likely occur or not. The hazard index (HI) is the sum of the HQs from multiple contaminants. An HI greater than 1 suggests that adverse effects may be possible and would require consideration of cleanup alternatives.

Exposure Pathways & Potential Risk

Just because contamination exists does not mean the environment or people are at risk. One has to have exposure to the contaminant to have a potential risk. If there is no exposure, there is no potential risk. Exposure occurs when people or other living organisms eat, drink, breathe or have direct contact with a substance or waste material. Based on existing or reasonably anticipated future land use at a Site, EPA develops different exposure scenarios to determine potential risk, appropriate cleanup levels for contaminants, and potential cleanup approaches, all of which are documented in the FS.

Human health and ecological risk assessments have been prepared for the Site. Detailed risk summaries can be found in the FS, Baseline HHRA (November 2021), HHRA Addendum (2020), HHRA Exposure Assumptions Refinement Technical Memorandum (EPA 2023), SLERA (August 2018), SLERA Update Technical Memorandum (March 2020) and ERA Technical Memorandum (May 2023). These conservative assessments use a number of possible contamination exposure scenarios to determine if and where there are current or potential future unacceptable risks to humans and/or the environment.

Human Health Risks

People have the potential for exposure to Site contaminants through the following exposure pathways: direct contact with soils, drinking and direct contact with groundwater, inhalation of vapors emanating from groundwater, and eating fish from the Target Reach of the Presumpscot River. Further discussion of the exposure pathways is presented below.

Site Exposure Assumptions

The exposure assessment characterizes the physical setting of the Site and evaluates the exposures that may be experienced by a receptor population. To have an exposure, several factors must be present: a source of contamination, a mechanism through which a receptor can come into contact with the contaminants in that medium, and a potential or actual receptor present at the point of contact.

Health risks were evaluated for possible current and future uses of the Site, including residential, recreational, commercial/industrial and trespasser use. The Mill Complex Property, which constitutes the majority of the Site, is zoned for multiple uses including residential, childcare, senior housing, commercial facilities, restaurants, and recreational facilities. Residential use refers to use of property for the location of residential dwellings, with the assumption that young children and adults spend the majority of their time each day in the residential dwelling at their property. Residential land uses are assumed to involve exposure to soil and use of groundwater as both a drinking water and non-drinking water source (*e.g.*, for showering or watering plants). Recreational use refers to leisure and sporting activities such as walking, boating, swimming, or wading/fishing by children and adults. The recreational use scenario evaluated exposure to surface water and sediment through swimming and wading activities. Adolescent trespasser exposure to surface soil (0 to 0.5 feet below ground surface), commercial/industrial worker exposures to soil and construction worker exposure to trench groundwater were also evaluated.

Based on the results of the Baseline HHRA and associated refinements, EPA found that the following pathways pose unacceptable human health risks because the calculated risks exceed EPA's acceptable cancer risk range of 10^{-6} to 10^{-4} and/or the non-cancer Hazard Index of 1. Exposures to lead at the Mill Complex Property do not exceed EPA's target level of concern for child residents, commercial/industrial workers or recreational anglers.

- Future residents, commercial/industrial workers, trespassers and recreational visitors exposed to surface soil (0 to 0.5 feet below ground surface) and/or aggregate soil (0 to 10 feet below ground surface) at the Mill Complex Property due primarily to total PCBs, PCB dioxin-like congeners, 2,3,7,8-TCDD, select PAHs (*i.e.*, benzo(a)pyrene and dibenz(a,h)anthracene) and metals (*i.e.*, antimony, arsenic and iron).
- Current and future recreational anglers exposed to fish tissue within the Target Reach of the Presumpscot River due to total PCBs.
- Future residents exposed to tap water due primarily to total PCBs, PCB dioxin-like congeners, select VOCs (*i.e.*, chloroform, 1,4-dichlorobenzene, TCE and vinyl chloride), select PAHs (*i.e.*, naphthalene and 2-methylnaphthalene), pentachlorophenol, metals (*i.e.*, arsenic, iron and manganese) and cyanide.
- Future construction workers exposed to trench groundwater and vapors in construction trenches from groundwater due primarily to naphthalene and cyanide.

The detailed evaluation of the potential human health risks is presented in the HHRA documentation (see Volume II of the Remedial Investigation Report). These were used to develop the cleanup alternatives presented in the FS.

Threats to the Environment

A SLERA was initially performed using available soil, sediment, surface water and tissue (fish and earthworm) analytical data. The SLERA process included: identification and selection of key habitats; identification of

ecological receptors and measures of effect; development of screening-level benchmarks; development of exposure estimates and risk calculations; and documentation of risk conclusions. Potential ecological risk was evaluated through calculation of a HQ for each contaminant; contaminants with an HQ of one or greater were labeled as contaminants of potential ecological concern (COPECs). The SLERA identified several COPECs in the aquatic and terrestrial habitats evaluated as potentially affected by the Site, which prompted further investigation.

Supplemental data was collected and further evaluation was conducted in support of refinement of the SLERA. The ERA Technical Memorandum (May 2023) endeavored to synthesize previous findings, clarify assumptions, justify the selection of chemicals of ecological concern (COECs) and develop ecological Preliminary Remediation Goals (PRGs) in support of the FS. Overall, the following receptors were determined to be at risk due to Site-related contaminants:

- Soil invertebrates due to total PCBs and arsenic in soil; and
- Benthic invertebrates due to total PCBs in sediments within the Target Reach of the Presumpscot River.

As a result, unacceptable risk to these receptors is included in the evaluation of response actions detailed in the FS.

Principal Threat Waste

The National Contingency Plan (NCP), which governs EPA cleanups, at 40 C.F.R. § 300.430(a)(1)(iii), states that EPA expects to use "treatment to address the principal threats posed by a site, wherever practicable" and "engineering controls, such as containment, for waste that poses a relatively low long-term threat" to achieve protection of human health and the environment. This expectation is further explained in an EPA fact sheet (OSWER #9380.3-06FS), which states that principal threat wastes are source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur. Low-level threat wastes are source materials that generally can be reliably contained and that would present only a low risk in the event of exposure.

The concept of principal threat and low-level threat waste is applied on a site-specific basis when characterizing source material. Source material is defined as material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for migration of contamination to groundwater, surface water, air, or act as a source of direct exposure.

Although EPA has not established a threshold level of toxicity/risk to identify a principal threat waste; however, where toxicity and mobility of source materials combine to pose a potential risk of 10^{-3} or greater, generally treatment alternatives should be evaluated. Based on the results of the RI and associated risk assessments, source material at the Site, consisting primarily of COCs in the soil/debris that have migrated to groundwater, sediment and fish tissue, constitute a low-level threat waste.

Basis for Taking Action

It is EPA's current judgment that the preferred alternative identified in this Proposed Plan, or one of the other active measures considered in the Proposed Plan, is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances and pollutants or contaminants from the Site which may present an imminent and substantial endangerment to public health or welfare.

CLEANUP ALTERNATIVES CONSIDERED

Once possible exposure pathways and potential risk have been identified at a site, cleanup alternatives are developed to reduce and/or mitigate the identified risks and achieve the site-specific Remedial Action Objectives (RAOs), which are also known as cleanup objectives. The RAOs for the Keddy Mill Superfund Site are as follows

- Protection of Human Health:
    - Prevent direct exposure (dermal contact, ingestion or inhalation) to COCs in soil/debris in excess of proposed risk-based cleanup levels.
    - Prevent the migration of contaminants from soil/debris (including up to a 500-year flood event) to groundwater, sediments and fish tissue within the Target Reach of the Presumpscot River.
    - Prevent direct exposure (dermal contact, ingestion or inhalation) to COCs in groundwater in excess of ARARs and proposed risk-based cleanup levels.
    - Restore contaminated groundwater to levels that allow beneficial use.
    - Reduce the amount of total PCBs in sediment to ensure that concentrations in fish tissue no longer present an unacceptable risk in the Target Reach of the Presumpscot River.
    - Prevent direct exposure (ingestion) by individuals consuming fish tissue from the Target Reach of the Presumpscot River until fish tissue no longer presents an unacceptable fish consumption risk.
    - Prevent direct exposure (inhalation) to COCs in vapors that off gas from shallow groundwater in construction trenches above levels that are protective for construction workers until groundwater is restored to its beneficial use.
- Protection of the Environment:
    - Prevent exposure of ecological receptors to COCs in soil/debris that present an unacceptable ecological risk.
    - Prevent exposure of ecological receptors to COCs in sediment within the Target Reach of the Presumpscot River that present an unacceptable ecological risk.
    - Prevent further migration of COCs from soil/debris to sediments within the Target Reach of the Presumpscot River (including up to a 500-year flood event).

Table 1 presents the proposed site contaminant cleanup levels and the basis for selection for each exposure scenario described above found to pose an unacceptable risk to human health or the environment.

Once cleanup objectives have been determined, response actions to meet these objectives are then identified, and those actions are grouped into potential alternatives that may be effective at minimizing or eliminating and unacceptable risk. The remedial alternatives developed for the Site in the FS are listed below and assume implementation of a selected remedy following the substantial completion of the NTCRA to demolish the mill complex and associated structures. EPA's preferred alternatives are indicated for each media (i.e., soil, groundwater and sediment [inclusive of fish consumption risk]). Additionally, EPA and MEDEP have had substantive discussions regarding the alternatives.

Soil Alternatives

EPA's evaluated alternatives for soil/debris within the footprint of the Mill Complex Property. Contamination that has come to be located beyond the southern boundary of the Mill Complex Property, is being addressed under State authority and oversight.

Alternative SO-1 (No Action)

Alternative SO-1 is required by the NCP to be evaluated and is used as a baseline for comparison to other cleanup alternatives. Under this alternative, no action would be taken to address contamination in soil and RAOs

would not be achieved. As required by CERCLA, a review of Site conditions and risks would be conducted every five years. There is no cost estimated as part of this alternative.

Alternatives SO-2 (Excavation, Off-Site Disposal, On-Site Consolidation, Capping and Institutional Controls)

Alternative SO-2 was developed to use engineering controls (*i.e.*, multi-layer cover) that prevent or limit exposure to contaminated soil within the Mill Complex Property. Total PCB concentrations in soil at or greater than 50 mg/kg would be excavated, segregated from other soils, and disposed of off-site at an approved TSCA or hazardous waste disposal facility. Soils with *in situ* total PCB concentrations of greater than 10 mg/kg and less than 50 mg/kg would be disposed of off-site at a facility licensed to accept the contaminated soil. Soil with contaminants exceeding proposed cleanup levels, that don't exceed hazardous waste characteristics, or with PCBs equal or greater than the proposed cleanup level of 1 mg/kg and less than or equal to 10 mg/kg would be excavated and consolidated in an on-site consolidation area under a low-permeability, multi-layer engineered cover consistent with an approved risk-based approach under 40 CFR § 761.61(c). Water generated from any required dewatering of the excavations or saturated soils would be treated, as required, prior to being appropriately discharged (*e.g.*, to the river, to a municipal sewer system, to groundwater, or sent to an off-site disposal facility). The cover would effectively prevent direct human and ecological contact with the contaminants; meet the high occupancy requirements under TSCA at CFR § 761.61(a)(7); be consistent with the reasonably anticipated future land use of the Site, which includes mixed residential use; and prevent contaminated soil migration to the river. Treatment reagent would be applied during excavation/backfilling should baseline groundwater and Pre-Design Investigation (PDI) soil analytical results indicate that application of a treatment reagent would be beneficial to the achievement of the groundwater RAOs. The cover would be sited outside of the 500-year floodplain and post-remedial grading would result in no flood storage loss while stabilizing the riverbank. This alternative includes ICs, long-term monitoring of groundwater and O&M of the cover. Five-year reviews would be carried out for as long as waste exceeding CERCLA risk standards remains on-site. The estimated total present value for this alternative is $10,803,000.

Alternative SO-3 (Excavation and Off-Site Disposal) – EPA's Preferred Alternative

Alternative SO-3 was developed as a "clean closure" option that results in unlimited and unrestricted future reuse of the parcel. Alternative SO-3 is generally consistent with Alternative SO-2 in the management of soil, applicable disposal facilities, management of water from dewatering, use of treatment reagents and restoration; however, Alternative SO-3would prevent exposure to contaminated soil through the excavation of all soil exceeding proposed cleanup levels and disposing the excavated materials at off-site disposal facilities that are licensed to accept the specific categories and concentrations of contaminants found at the Site. Five-year reviews, ICs, long-term monitoring and O&M would not be required because no soil contaminants above proposed cleanup levels would remain at the Site. Alternative SO-3 is EPA's preferred alternative and the estimated total present value for this alternative is $14,113,000.

Groundwater Alternatives

Alternative GW-1 (No Action)

As a baseline to compare against other alternatives, no action would be taken under Alternative GW-1 to address contamination in Site groundwater. No construction or treatment of contaminants would take place and RAOs would not be achieved. There is no cost estimated as part of this alternative.

Alternative GW-2 (Monitored Natural Attenuation and Institutional Controls)

Alternative GW-2 uses monitored natural attenuation (MNA) (*i.e.*, reliance on natural physical, chemical or biological processes that act to reduce mass, toxicity, mobility, volume or concentration of contaminants) and ICs to protect human health by preventing or controlling exposure to hazardous substances in groundwater without active remediation until groundwater cleanup levels are achieved through natural processes. Reduction of risks posed by contaminated groundwater until groundwater cleanup levels are achieved would be addressed using ICs to prevent exposure to groundwater from residential tap water use (via ingestion, inhalation, and dermal exposure) and exposure to groundwater in trenches (construction worker exposure to trench groundwater and

vapors) until cleanup levels are achieved. A preliminary evaluation indicates that some level of natural attenuation is occurring. For example, groundwater samples indicate dissolved oxygen levels generally below 0.5 mg/L, indicative of anaerobic conditions conducive to reductive dechlorination, in the majority of monitoring wells impacted by Site-related contaminants. In addition, common breakdown (or "daughter") compounds associated with reductive dechlorination (e.g., cis-1,2-dichloroethene and vinyl chloride) are present in association with elevated levels of TCE in groundwater. As a result, MNA modeling, based on EPA guidance standards, was used to evaluate the timeframe for achievement of cleanup levels assuming on-going natural abiotic and biotic attenuation processes. The modeling assumed soil source control measures (including adding treatment amendments to the excavation areas prior to refilling) and resulted in an estimated timeframe to achieve groundwater cleanup levels of approximately 30-years; however, active groundwater treatment is anticipated to achieve cleanup standards sooner. Long-term monitoring would provide periodic assessments of the progress being made by the MNA remedy and ICs and five-year reviews would be required until groundwater cleanup levels are achieved. The estimated total present value for this alternative is $714,000.

Alternative GW-3 (*In Situ* Treatment, Baseline and Post-Treatment Monitoring and Institutional Controls) – EPA's Preferred Alternative

Alternative GW-3 considers focused *in situ* treatment to address proposed cleanup level exceedances in Site groundwater. ICs would prevent ingestion, inhalation and dermal exposure to contaminated groundwater that pose threats to future residents and exposure of construction workers to trench groundwater and vapor until cleanup levels are achieved. Alternative GW-3 assumes that an active soil remedial action would be implemented to remove sources of groundwater contamination (including adding treatment amendments to the excavation areas prior to refilling). *In situ* treatment technologies (*e.g.*, oxidizing reagents, colloidal activated carbon) would be assessed and selected based on Site-specific conditions following the remedial action for soil and may vary to adequately address on-site localized groundwater contamination. The alternative is expected to achieve groundwater cleanup levels in 12-years. Notably, organic contaminants are anticipated to achieve cleanup goals upon completion of *in situ* treatment activities; however, it may take several additional years for geochemical conditions to revert to ambient conditions. Long-term monitoring would provide periodic assessments of the progress being made by the treatment remedy and ICs and five-year reviews would be required until groundwater cleanup levels are achieved. The estimated total present value for this alternative is $2,035,000.

Sediment Alternatives

Alternative SED-1 (No Action)

As a baseline to compare against other alternatives, no action would be taken under Alternative SED-1 to address contamination in sediments within the Target Reach of the Presumpscot River. No construction would take place and RAOs would not be achieved. There is no cost estimated as part of this alternative.

Alternative SED-3A[4] (Mechanical Excavation, On-Site Consolidation and Institutional Controls)

Alternative SED-3A was developed to remove sediments that exceed the proposed sediment cleanup level for PCBs, preventing direct exposure to PCB contamination by individuals consuming fish tissue, preventing exposure of ecological receptors to contaminated sediments, and reducing the mass of PCBs in sediment that are bioavailable to the fish community. Alternative SED-3A includes targeted mechanical excavation of sediments exceeding the proposed cleanup level within the Target Reach, dewatering and consolidation of sediments with up to 10 mg/kg of PCBs (*in situ*) in an on-site consolidation area under a low-permeability, multi-layer, engineered cover consistent with an approved risk-based approach under 40 CFR § 761.61(c). Selection of this alternative for sediments is predicated on the corresponding consolidation of soil under Alternative SO-2. Sediments with *in situ* total PCB concentrations of greater than 10 mg/kg and less than 50 mg/kg would be disposed of off-site at a facility licensed to accept the contaminated sediment. No sediments equal or exceeding 50 mg/kg of PCBs are expected to occur, but if encountered these would need to be segregated from other

[4] Alternative SED-2 Monitored Natural Recovery was not carried through to the full alternative analysis, but the original alternative numbering was retained.

sediments and disposed of off-site at an approved TSCA or hazardous waste disposal facility. Limited areas of the river along the eastern bank would be temporarily enclosed with a temporary dam or other structures, the areas dewatered and the water discharged back to the river to allow access to the contaminated sediments under dry conditions. Floodplain mitigation measures would be implemented (as needed) before temporarily enclosing limited portions of the river. Resource area restoration would be required after completion of the sediment removal.

Alternative SED-3A assumes that remediation of soil and sediment would result in a reduction in the uptake of contaminants by fish. As younger fish mature, it is expected there would be much less bioaccumulation of PCBs resulting in improved reductions in PCB concentrations in fish tissue. Protection of human health until fish tissue no longer poses a consumption risk would be achieved through the use of long-term monitoring and ICs such as a fish consumption restrictions and/or fishing restrictions (*i.e.*, catch and release) in the Target Reach of the Presumpscot River, as well as the placement and maintenance of signage advising against fish consumption and public outreach.

This alternative relies on the ICs, long-term monitoring and the O&M components of Alternative SO-2 (if selected as the soil component of the remedy) to maintain the protectiveness of the permanent on-site disposal of the contaminated sediments. Five-year reviews would be required for as long as the contaminated sediments remain on-site within the consolidation area. The estimated total present value for this alternative is $735,000.

Alternative SED-3B (Mechanical Excavation and Off-Site Disposal) – EPA's Preferred Alternative

Alternative SED-3B was developed to remove sediments that exceed the proposed sediment cleanup level for PCBs, resulting in the prevention of direct exposure to PCB contamination by individuals consuming fish tissue, preventing exposure of ecological receptors to contaminated sediments, and reducing the mass of PCBs in sediment that are bioavailable to the fish community. Alternative SED-3B includes mechanical excavation of targeted sediments exceeding the proposed sediment cleanup level for PCBs within the Target Reach, sediment dewatering and disposal in a manner generally consistent with Alternative SED-3A; however, all excavated material would be transported off-site for disposal. The same measures to temporarily enclose and dewater the sediment excavation areas, implement any needed floodplain mitigation, and restore the excavated areas after completion of the work as described for Alternative SED-3A, would be taken.

Consistent with Alternative SED-3A, Alternative SED-3B assumes that remediation of soil and sediment would result in a reduction in the uptake of contaminants by fish. Long-term monitoring, ICs, limited O&M (e.g., signage maintenance), and five-year reviews would be required until fish consumption no longer poses a risk. The estimated total present value for this alternative is $860,000.

THE NINE CRITERIA FOR CHOOSING A CLEANUP PLAN

EPA uses nine criteria to evaluate cleanup alternatives and select a final cleanup plan. EPA has already evaluated how well each of the cleanup alternatives developed for the Keddy Mill Superfund Site meet the first seven criteria in the FS. Once comments from the State and the community are received and considered, EPA will select the final cleanup plan and document its selection in the Record of Decision (ROD) for the Site.

1. **Overall protection of human health and the environment:** Will it protect you and the plant and animal life on and near the Site? EPA will not choose a cleanup plan that does not meet this basic criterion.
2. **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs):** Does the alternative meet all federal and state environmental statutes, regulations and requirements? The cleanup plan must meet this criterion.
3. **Long-term effectiveness and permanence:** Will the effects of the cleanup plan last or could contamination cause future risk?

4. **Reduction of toxicity, mobility or volume through treatment:** Using treatment, does the alternative reduce the harmful effects of the contaminants, the spread of contaminants, and the amount of contaminated material?
5. **Short-term effectiveness:** How soon will site risks be adequately reduced? Could the cleanup cause short-term hazards to workers, residents or the environment?
6. **Implementability:** Is the alternative technically feasible? Are the right goods and services (*i.e.*, treatment equipment, space at an approved disposal facility) available?
7. **Cost:** What is the total cost of an alternative over time? EPA must select a cleanup plan that provides necessary protection for a reasonable cost.
8. **State acceptance:** Do State environmental agencies agree with EPA's proposal?
9. **Community acceptance:** What support, objections, suggestions or modifications did the public offer during the comment period?

CLEANUP ALTERNATIVES COMPARISON

The alternatives for soil, groundwater and sediment were compared with each other to identify how well each alternative meets EPA's evaluation criteria. The State and community acceptance criteria will be evaluated once feedback is received during the public comment period. The following discussion and Table 2 present a general media-specific comparison summary of the alternatives.[5] Detailed evaluations and comparisons of alternatives are included in the FS.

Soil Alternatives

Overall Protection of Human Health and the Environment

Alternative SO-1 (No Action) would not be protective of human health or the environment because potential exposure to contaminated soil would not be prevented. Alternative SO-1 does not meet this criterion. Alternative SO-3 is considered the most effective at protecting human health and the environment as the alternative prevents potential exposure by human health and ecological receptors through the removal of soil with COCs in excess of cleanup levels from the Site. Alternative SO-2 is protective of human health and the environment as soil with COCs in excess of cleanup levels will be excavated and either consolidated and covered on-site or, for soil exceeding certain contaminant levels, disposed of off-site.

Compliance with ARARs

Alternative SO-1 (No Action) does not achieve risk-based soil cleanup levels and does not prevent exposure to contaminated soil exceeding the risk-based cleanup levels. No activities would be performed under Alternative SO-1, thus action-specific and location-specific ARARs do not apply to this alternative. With proper implementation, it is anticipated that Alternatives SO-2 and SO-3 would meet all chemical-specific, action-specific and location-specific ARARs and risk-based cleanup levels.

Work in the 100- and 500-year floodplains will occur with Alternatives SO-2 and SO-3 and will result in temporary occupancy and modification of the floodplain. As required by federal floodplain regulations, EPA has made a draft determination that there was no other practicable alternative to address contamination within the floodplain before selecting Alternative SO-3 as the preferred remedy. Any temporary impacts to floodplain resources will be addressed prior to implementation of the remedy to protect downstream floodplain resources. Upon completion of the excavation work in the floodplain, the area will be backfilled to the original grade to avoid loss of flood storage capacity.

[5] Table 2 is not a substitute for the detailed alternatives analysis included in the Feasibility Study. It is an evaluation summary intended to be helpful for the public.

While no direct impacts to wetlands are anticipated, work within State-designated buffer zones to protected wetland/riparian resources will be conducted to prevent erosion and other potential impacts to the protected resources.

Long-term Effectiveness and Permanence

Alternative SO-1 (No Action) is not effective in the long-term and does not provide permanent protection from contaminants. The excavation and off-site disposal components of Alternatives SO-2 and SO-3 are reliable and are adequate methods to achieve RAOs. Alternative SO-3 is permanent and has the highest long-term effectiveness in mitigating risks remaining at the Site after RAOs have been met and limiting the magnitude of risks from untreated wastes or residual soils as all soil exceeding cleanup levels would be excavated and subject to off-site disposal. Alternative SO-2 would also be effective in the long-term in mitigating risks after RAOs have been met but removes less soil from the Site than Alternative SO-3. Alternatives SO-2 would rely on controls, inspections, and long-term monitoring activities as residual soils would remain on the Site covered under the consolidation area.

Alternative SO-3 is the most resilient to a changing climate as this alternative removes soil with COCs in excess of cleanup levels for off-site disposal. Alternative SO-2 includes a degree of on-site consolidation and capping of contaminated soil, which would be designed and implemented in a manner that limits vulnerability while maximizing resilience to climate change (*i.e.*, consolidation and capping would occur outside the 500-year floodplain).

Reduction of Contaminant Toxicity, Mobility or Volume through Treatment

Alternative SO-1 (No Action) does not utilize an active treatment process and does not meet this criterion. Treatment reagent will be applied during excavation/backfilling in association with Alternatives SO-2 and SO-3 should baseline groundwater and PDI soil analytical results indicate that application of a treatment reagent would be beneficial to the achievement of the groundwater RAOs. The only other potential treatment included in Alternatives SO-2 and SO-3 is either the treatment of any water generated from soil dewatering or dewatering of excavations or any pre-treatment that may be required to dispose of waste off-site.

Short-term Effectiveness

Since no construction activities or remedial actions are proposed under Alternative SO-1 (No Action), there are no short-term risks to the community or workers for this alternative. Alternatives SO-2 and SO-3 have the same excavation footprint and therefore similar timeframes to achieve RAOs; however, the volume of soil to remain on-site and to be moved off-site varies for each alternative. Alternatives SO-2 and SO-3 require contaminated soil to be handled multiple times during the remediation process (*i.e.*, excavation, stockpiling/characterization, on-site placement and/or off-site disposal). Alternative SO-2 requires a greater degree of material handling and management due to the construction of an on-site consolidation area, as well as off-site disposal of material. Short-term risks include dust, noise, and disruption to regular vehicular traffic for both alternatives. The short-term risks associated with Alternatives SO-2 and SO-3 to workers and the community can be mitigated with the use of appropriate personal protective equipment, proper health and safety practices during construction activities, compliance with comprehensive plans and proper handling and management of contaminated soil.

Since no construction activities or remedial actions are proposed under Alternative SO-1, there are no short-term risks to the environment. Short-term environmental impacts from Alternatives SO-2 and SO-3 would occur due to the remedial actions (*e.g.*, emissions from on-site equipment, soil excavation and management, dewatering). No permanent adverse impacts to the environment are anticipated as the result of either remedial action. Alternatives SO-2 and SO-3 have the same excavation footprint; however, the soil management and staging are anticipated to be most significant for Alternative SO-2 due to on-site consolidation and capping activities.

Sustainability was not considered for Alternative SO-1 because no action will be taken. Alternatives SO-2 and SO-3 are both anticipated to require similar energy expenditures to implement the pre-design investigation,

excavation and soil management activities, off-site disposal, and Site restoration activities due primarily to truck and vehicle use. Alternative SO-2 is anticipated to have a slightly higher energy use due to the construction of the on-site consolidation area.

Implementability

Alternative SO-1 (No Action) is the easiest to implement because no remedial activities will be taken. Implementation of Alternatives SO-2 and SO-3 are not highly complicated given the Site conditions and based on the currently assumed extents of soil contamination. Given the consistency in the anticipated excavation footprints for Alternatives SO-2 and SO-3, the required administrative approvals are generally anticipated to be similar. Alternative SO-2 would have additional administrative processes associated with monitoring and enforcing ICs, which are easily administered. All services and materials required for Alternatives SO-2 and SO-3 would be relatively easy to obtain and competitively bid.

Cost

There is no cost estimated as part of Alternative SO-1 (No Action). Alternatives SO-2 is considered the least expensive active remedial alternative (estimated to be $10,803,000), with Alternative SO-3 being the most expensive (estimated to be $14,113,000).

Groundwater Alternatives

Overall Protection of Human Health and the Environment

Alternative GW-1 (No Action) provides no protection of human health or the environment as no actions will be taken to reduce the risk presented by contamination in groundwater. Alternative GW-2 is protective of human health through the implementation of the MNA in combination with ICs. Alternative GW-3 provides protection of human health by supplementing the soil source removal with *in situ* chemical oxidation treatment of organic contaminants and metals. Alternative GW-3 will decrease the volume of contaminated overburden and bedrock groundwater. Alternatives GW-2 and GW-3 are protective of the environment because groundwater does not directly contribute to ecological risks.

Compliance with ARARs

Alternative GW-1 (No Action) does not achieve chemical-specific ARARs and risk-based groundwater cleanup levels and does not prevent exposure to contaminated groundwater exceeding the ARARs and risk-based cleanup levels. No activities would be performed under GW-1, thus action-specific and location-specific ARARs do not apply to this alternative. With proper implementation, it is anticipated that Alternatives GW-2 and GW-3 would meet all chemical-specific, action-specific and location-specific ARARs and risk-based cleanup levels.

Once soil source control action is completed, Alternative GW-2 will attain the chemical-specific ARARs and risk-based cleanup levels (approximately 30-years). The Site's natural process will be further enhanced by placement of amendments during implementation of the soil source control action. Alternative GW-3 will attain chemical-specific ARARs and risk-based cleanup levels in approximately 12-years through *in situ* treatment of groundwater contaminants, attenuation of groundwater geochemistry to ambient conditions, and ICs to prevent exposure to groundwater contamination and vapors in construction trenches until groundwater cleanup levels are achieved.

Long-term Effectiveness and Permanence

Alternative GW-1 (No Action) is not effective and does not provide permanent protection from contaminants in groundwater. Although amendment application during the implementation of the soil source control action will support cleanup of the groundwater, Alternative GW-2 relies on ICs in the long term to prevent potential exposures to contaminated groundwater. Alternative GW-3 provides for the permanent decrease in groundwater contaminant concentrations through *in situ* treatment within a shorter period of time than Alternative GW-2 (approximately 12-years versus 30-years). Alternatives GW-2 and GW-3 are both dependent on the proper implementation, monitoring, and enforcement of ICs and five-year reviews to remain effective.

Alternatives GW-2 and GW-3 will be coordinated with an active soil remedial action to address the primary source to groundwater prior to implementation and therefore are similarly resilient to climate change. Alternative GW-3 is slightly more resilient to climate change as it is anticipated to achieve RAOs in a shorter timeframe.

Reduction of Contaminant Toxicity, Mobility or Volume through Treatment

Alternatives GW-1 (No Action) and GW-2 do not utilize an active treatment process and do not meet this criterion. Alternative GW-3 will use *in situ* chemical oxidation to address the groundwater contaminants, which will reduce toxicity, mobility, and volume and satisfy CERCLA's statutory preference for treatment.

Short-term Effectiveness

Since no construction activities or remedial actions are proposed under Alternative GW-1 (No Action), there are no short-term risks to the community or workers for this alternative. Implementation of Alternative GW-2 will have minimal impacts to workers and the community as limited actions (*e.g.*, well installation and maintenance, long-term monitoring, and inspections) are anticipated. Impacts to the community are expected to be limited in association with Alternative GW-3; however, the handling, mixing and injection of treatment reagents pose potential health and safety risks to on-site worker. The risk of harm to the on-site worker can be mitigated through proper planning, implementation of work and health and safety plans, use of appropriate personal protective equipment, and application of proper engineering controls and health and safety procedures. Alternative GW-3 is anticipated to achieve RAOs in the shortest timeframe.

Since no construction activities or remedial actions are proposed under Alternative GW-1, there are no short-term risks to the environment. Short-term environmental impacts from Alternatives GW-2 and GW-3 are anticipated to be limited and no permanent adverse impacts are expected.

Sustainability was not considered for Alternative GW-1 because no action will be taken. Long-term monitoring, well installation and maintenance, periodic inspections, ICs and five-year reviews in association with Alternative GW-2 are not energy intensive activities and have low environmental impacts. Alternative GW-3 will have the most environmental impacts for its energy consumption, vehicular emissions, expendable materials usage, and generation of investigation-derived waste when compared with the other groundwater alternatives; however, implementation of Alternative GW-3 will result in faster attainment of RAOs.

Implementability

Alternative GW-1 (No Action) is the easiest to implement because no remedial activities will be taken. Alternatives GW-2 and GW-3 are not considered highly complex, are reliable and are commonly implemented at similar environmental restoration sites. Limited implementability issues are anticipated in association with long-term monitoring and inspections as part of Alternative GW-2. No construction activities are anticipated in association with Alternative GW-3 and the pre-design investigation, *in situ* treatment, post-treatment monitoring, and ICs can be readily implemented. There are no limitations in availability of firms, equipment, or materials that would limit the implementation of Alternatives GW-2 and GW-3. The creation, monitoring and enforcement of ICs for both Alternatives GW-2 and GW-3 should be easily implemented.

Cost

There is no cost estimated as part of Alternative GW-1 (No Action). Alternatives GW-2 is considered the least expensive active remedial alternative (estimated to be $714,000), with Alternative SO-3 being the most expensive (estimated to be $2,035,000).

Sediment Alternatives

Overall Protection of Human Health and the Environment

Alternative SED-1 (No Action) would not be protective of human health or the environment because potential exposure to contaminated sediment and fish tissue would not be prevented. Alternative SED-1 does not meet

this criterion. Alternative SED-3A is protective of human health and the environment as sediments with PCBs in excess of ecological cleanup levels will be excavated for on-site consolidation and off-site disposal (as appropriate). Removal of the contaminated sediments, with disposal on-site in the consolidation area or off-site will reduce PCB levels in the aquatic ecosystem to address fish consumption risk. As a result, the overall protectiveness of the Alternative SED-3A remedy relies on maintaining the long-term protectiveness of the Alternative SO-2 soil remedy (*e.g.*, O&M, long-term monitoring, ICs and five-year reviews). Alternative SED-3A also includes ICs to prevent human health exposure to fish tissue via consumption until fish tissue no longer poses a consumption risk.

Alternative SED-3B is considered the most effective at protecting human health and the environment, as this alternative removes sediment PCBs exceeding ecological cleanup levels and will reduce PCBs levels in the aquatic ecosystem to address fish consumption risks consistent with an approved risk-based approach under 40 CFR § 761.61(c). All contaminated sediments will be disposed of off-site. Similar to Alternative SED-3A, this alternative includes ICs, long-term monitoring and five-year reviews to prevent human health exposure to fish tissue via consumption until risk-based cleanup levels in fish tissue are achieved; however, maintaining the protectiveness of the soil component of the remedy is not fundamental to Alternative SED-3B.

Compliance with ARARs

Alternative SED-1 (No Action) does not achieve risk-based sediment cleanup levels and does not prevent exposure to contaminated sediment exceeding the ecological risk-based cleanup levels, nor does it address fish consumption risks. No activities would be performed under Alternative SED-1, thus action-specific and location-specific ARARs do not apply to this alternative. With proper implementation, it is anticipated that Alternatives SED-3A and SED-3B would meet all chemical-specific, action-specific and location-specific ARARs and risk-based cleanup levels.

Alternatives SED-3A and SED-3B will impact the riverbed, riverbank and emergent wetlands within the Target Reach during excavation of contaminated sediment. The excavation footprints for both alternatives are the same; however, Alternative SED-3A includes on-site consolidation which will result in slightly greater temporary disturbance compared to Alternative SED-3B. EPA has made a draft determination that Alternative SED-3B is the least environmentally damaging practicable alternative under the federal Clean Water Act for protecting the riverbed, riverbank and wetland areas because it will permanently remove contamination from such areas and will restore the areas once the contaminated sediment is removed.

Work in the 100- and 500-year floodplains will occur with Alternatives SED-3A and SED-3B and will result in temporary occupancy and modification of the river and the floodplain. Any temporary impacts to the river and floodplain will be addressed prior to implementation of the remedy to protect downstream floodplain resources. However, upon completion of the excavation work, the area will be backfilled to the original grade to avoid loss of flood storage capacity or any permanent floodplain impacts. As required by federal floodplain regulations, EPA has made a draft determination that there was no other practicable alternative to address contamination within the floodplain before selecting Alternative SED-3B as the preferred remedy.

Long-term Effectiveness and Permanence

Alternative SED-1 (No Action) is not effective in the long-term and does not provide permanent protection from contaminants. The excavation and off-site disposal components of Alternatives SED-3A and SED-3B are reliable and are adequate methods to achieve RAOs. Alternative SED-3B is permanent and has the highest long-term effectiveness in mitigating risks remaining at the Site after RAOs have been met and limiting the magnitude of risks from untreated or residual waste as all sediment exceeding the cleanup level for PCBs would be excavated and subject to off-site disposal. Alternative SED-3A would also be effective in the long-term in mitigating risks after RAOs have been met but removes less sediment from the Site than Alternative SED-3B and instead partially relies on maintaining the long-term effectiveness of the consolidation area. Alternatives SED-3A and SED-3B both rely on long-term monitoring and ICs to prevent human health exposure to fish tissue via consumption until risk-based cleanup levels in fish tissue are achieved.

Alternative SED-3B is the most resilient to a changing climate as this alternative includes targeted removal of contaminated sediment for off-site disposal. Alternative SED-3A includes a degree of on-site consolidation and capping of contaminated sediment, which could be designed and implemented in a manner that limits vulnerability while maximizing resilience to climate change.

Reduction of Contaminant Toxicity, Mobility or Volume through Treatment

Alternative SO-1 (No Action) does not utilize an active treatment process and does not meet this criterion. Alternatives SED-3A and SED-3B may include some minor treatment of water generated from dewatering activities, otherwise these alternatives do not meet the criterion.

Short-term Effectiveness

Since no construction activities or remedial actions are proposed under Alternative SED-1 (No Action), there are no short-term risks to the community or workers for this alternative. Alternatives SED-3A and SED-3B have the same excavation footprint and therefore similar timeframes to achieve RAOs; however, the volume of sediment to remain on-site and to be moved off-site varies between the alternatives. Alternative SED-3A requires a greater degree of material handling and management due to the placement in an on-site consolidation area, as well as off-site disposal of material. Short-term risks include dust, noise, and disruption to regular vehicular traffic for both alternatives. The short-term risks associated with Alternatives SED-3A and SED-3B to Site workers and the community can be mitigated with the use of appropriate personal protective equipment, proper health and safety practices during construction activities, compliance with comprehensive plans and proper handling and management of contaminated sediment.

Since no construction activities or remedial actions are proposed under Alternative SED-1, there are no short-term risks to the environment. Short-term environmental impacts would occur due to the remedial actions (*e.g.*, riverbed isolation and dewatering, excavation and backfilling, emissions from on-site equipment, sediment management, dewatering) associated with Alternatives SED-3A and SED-3B. Alternatives SED-3A and SED-3B have the same excavation footprint; however, the added step of transporting dewatered sediment for disposal to the on-site consolidation area, constructed as part of the soil component of the remedy, slightly increases the short-term risks associated with Alternative SED-3A.

Sustainability was not considered for Alternative SED-1 because no action will be taken. A similar amount of energy would be required to implement the pre-design investigation, floodplain mitigation (as needed), the isolation and dewatering of the riverbed, excavation of the contaminated sediment, on-site consolidation and/or off-site disposal, and riverbank restoration under Alternatives SED-3A and SED-3B.

Implementability

Alternative SED-1 (No Action) is the easiest to implement because no remedial activities will be taken. Implementation of Alternatives SED-3A and SED-3B include mitigation (as needed) to offset the impacts from temporarily enclosing limited areas of the river, dewatering of the riverbed, and sediment excavation, dewatering, and management and are therefore more complex than Alternative SED-1; however, both employ common technologies including sediment excavation and disposal. Alternative SED-3A is slightly more complicated than Alternative SED-3B due to the on-site disposal of dewatered sediments into the consolidation area. Alternatives SED-3A and SED-3B would require comparable administrative processes, in particular to establish and maintain ICs. All services, equipment and materials required for Alternatives SED-3A and SED-3B are anticipated to be relatively easy to obtain and competitively bid.

Cost

There is no cost estimated as part of Alternative SED-1 (No Action). Alternatives SED-3A and SED-3B have similar estimated costs of $735,000 and $860,000, respectively.

WHY EPA RECOMMENDS THIS PROPOSED CLEANUP PLAN

Based on the results of the Remedial Investigations, human health and ecological risk assessments and associated refinements, and the FS for the Site, EPA recommends this proposed cleanup plan to be implemented following the substantial completion of the NTCRA. EPA believes the proposed cleanup plan for the Keddy Mill Superfund Site achieves the best overall balance among EPA's nine criteria (excluding State and community acceptance which will be considered following public comment) used to evaluate the various alternatives presented in the FS. The proposed cleanup plan meets the cleanup objectives or RAOs for the Site. EPA and MEDEP have had substantive discussions regarding the Site and the cleanup. EPA has received input indicating that MEDEP supports the proposed cleanup plan.

This Proposed Plan includes a summary in general terms of why EPA recommends the cleanup plan for the Site. For more detail, refer to the Feasibility Study Report.

Alternative SO-3 (Excavation and Off-Site Disposal) is EPA's preferred soil/debris alternative for the following reasons (Figure 3):

- Is the most effective at protecting human health and the environment as the alternative prevents potential exposure by human health and ecological receptors through the removal of soil/debris with COCs in excess of cleanup levels;
- Will meet all chemical-specific, action-specific and location-specific ARARs and risk-based cleanup levels;
- Achieves substantial risk reduction by both permanently removing and disposing of soil/debris from the Mill Complex Property off-site;
- Has the highest long-term effectiveness in mitigating risks remaining at the Site after RAOs have been met and limiting the magnitude of risks from untreated wastes or residual soils as all soil exceeding cleanup levels would be excavated and subject to off-site disposal;
- Allows for the application of a treatment reagent during excavation/backfilling should baseline groundwater and PDI soil analytical results indicate that application of a treatment reagent would be beneficial to the achievement of the groundwater RAOs.
- Has a lesser degree of short-term risk to the community and on-site workers than the other active remedial alternative;
- Has no significant implementability issues;
- Is the most resilient to a changing climate as soil with COCs in excess of cleanup levels will be removed for off-site disposal;
- Will mitigate impacts to the floodplain and result in no floodplain storage loss;
- Allows for the reasonably anticipated future use of the Mill Complex Property; and
- Does not require O&M, long-term monitoring or ICs.

Alternative GW-3 (*In Situ* Treatment, Baseline and Post-Treatment Monitoring and Institutional Controls) is EPA's preferred groundwater alternative for the following reasons (Figure 4):

- Achieves substantial risk reduction by permanently treating groundwater contamination throughout the Site;
- Provides for the permanent decrease in groundwater contaminant concentrations within a shorter period of time than the other alternatives;

- Will meet all chemical-specific, action-specific and location-specific ARARs and risk-based cleanup levels;
- Is the only alternative that will reduce toxicity, mobility, and volume through treatment, therefore satisfying CERCLA's statutory preference for treatment;
- Has no significant implementability issues, *in situ* treatment technologies are well established and ICs are easily implemented;
- Is the most resilient to a changing climate as cleanup levels will be achieved in a shorter timeframe; and
- Includes the implementation and enforcement of institutional controls to prohibit use of contaminated groundwater until cleanup levels are met.

Alternative SED-3B (Mechanical Excavation and Off-Site Disposal) is EPA's preferred sediment alternative for the following reasons (Figure 5):

- Is the most effective at protecting human health and the environment as the alternative prevents potential exposure by ecological receptors and will address human consumption risk from contaminated fish tissue through the removal of sediment with PCBs in excess of the cleanup level;
- Achieves substantial risk reduction by both permanently removing and disposing of sediment from the Target Reach of the Presumpscot River off-site;
- Will meet all chemical-specific, action-specific and location-specific ARARs and risk-based cleanup levels;
- Has a lesser degree of short-term risk to the community and on-site workers than the other active remedial alternative;
- Has no significant implementability issues;
- Will mitigate impacts to the riverbed, riverbank, wetlands and floodplain, will result in no impacts to downstream floodplain resources, permanent floodplain storage loss, and includes habitat restoration;
- Is the least environmentally damaging practicable alternative, as defined under the federal Clean Water Act, for protecting wetland resources;
- Is the most resilient to a changing climate as sediment with PCBs in excess of the cleanup level will be removed for off-site disposal; and
- Includes institutional controls to prohibit the consumption of fish from the Target Reach of the Presumpscot River until cleanup levels are met.

EPA believes that this proposed cleanup approach to address contaminated soil, groundwater, sediment, and fish tissue is protective of human health and the environment, uses proven cleanup technologies (*e.g.*, excavation and off-site disposal and *in situ* treatment) and is cost effective, while achieving the Site-specific cleanup objectives in a reasonable timeframe. This cleanup approach meets the NCP's criteria in providing both short and long-term protection of human health and the environment; attains applicable Federal and State environmental laws and regulations; reduces the toxicity, mobility, and volume of contaminated groundwater through treatment (with limited treatment included for the soil and sediment components of the cleanup); utilizes permanent solutions and uses land use restrictions to prevent unacceptable exposures in the future to the remaining Site-related wastes (*e.g.*, PCBs in fish tissue); has no significant implementability issues, and is cost effective.

The preferred cleanup approach would also avoid significant impacts to the floodplain, wetlands and natural resource areas, to the extent possible, and provide restoration of unavoidable damage to accelerate habitat recovery.

WHAT IS A FORMAL COMMENT

EPA will accept public comments during a 30-day formal comment period. EPA considers and uses these comments to improve its cleanup approach.

EPA is also specifically soliciting public comment on its proposed plan for protecting floodplain and wetland resources, specifically its draft determination that the alternatives chosen are the least environmentally damaging practicable alternatives for protecting wetlands and aquatic habitats. EPA is also specifically soliciting public comment on its draft TSCA Determination that is proposed plan for addressing PCB contamination in soil, groundwater, sediment and fish tissue will not result in an unreasonable risk of injury to health or the environment.

EPA will hold an informational meeting on **June 27, 2023**, prior to the start of the formal Public Comment period on **June 28, 2023.** During the formal comment period, EPA will accept written comments via mail, email, and fax. Additionally, verbal comments may be made during the formal Public Hearing on **July 18, 2023** during which a stenographer will record all offered comments during the hearing.

EPA will not respond to your comments during the formal Public Hearing. EPA will review the transcript of all formal comments received during the hearing, and all written comments received during the formal comment period, before making a final cleanup decision. EPA will then prepare a written response to all the formal written and oral comments received. Your formal comment will become part of the official public record. The transcript of comments and EPA's written responses will be issued in a document called a Responsiveness Summary when EPA releases the final cleanup plan, in a document referred to as the Record of Decision. The Responsiveness Summary and Record of Decision will be made available to the public on-line, at the Windham Public Library and at the EPA Records Center (see addresses below). EPA will announce the final decision on the cleanup plan through the local media and via EPA's website.

FOR MORE DETAILED INFORMATION:

The Administrative Record, which includes all documents that EPA has considered or relied upon in proposing this cleanup plan for the Keddy Mill Superfund Site is available for public review and comment at the following locations:

EPA Records and Information Center
5 Post Office Square, First Floor
Boston, MA 02109-3912
617-918-1440

Windham Public Library
217 Windham Center Road
Windham, Maine 04062
(207) 892-1908

Information is also available for review on-line at www.epa.gov/superfund/keddy

Key Contacts:

Jeffry Saunders
EPA New England
Remedial Project Manager
617-918-1352
saunders.jeffry@epa.gov

Charlotte Gray
EPA New England
Community Involvement Coordinator
617-918-1243
gray.charlotte@epa.gov

Tess Swiecanski
Maine Department of Environmental Protection
Project Coordinator
(207) 816-0112
tess.swiecanski@maine.gov

SEND US YOUR COMMENTS

Provide EPA with your written comments about the Proposed Plan for the Keddy Mill Superfund Site.

Please email (saunders.jeffry@epa.gov), fax (617-918-0352), or mail comments, **postmarked no later than July 28, 2023** to:

Jeff Saunders
EPA Region 1 New England
5 Post Office Square, Suite 100
Mail Code: 07-1
Boston, MA 02109-3912

Acronyms

2,3,7,8-TCDD	2,3,7,8-Tetrachlorodibenzo-p-Dioxin
ACM	Asbestos-Containing Material
ARAR	Applicable or Relevant and Appropriate Requirement
AST	Above-Ground Storage Tank
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Contaminants of Concern
COEC	Chemicals of Ecological Concern
COPEC	Contaminants of Potential Ecological Concern
CWA	Clean Water Act
FEMA	Federal Emergency Management Agency
FS	Feasibility Study
HHRA	Human Health Risk Assessment
HI	Hazard Index
HQ	Hazard Quotient
HRS	Hazard Ranking System
IC	Institutional Controls
MEDEP	Maine Department of Environmental Protection
µg/dL	micrograms per deciliter
µg/kg	micrograms per kilogram
mg/kg	milligram per kilogram
MNA	Monitored Natural Attenuation
NCP	National Contingency Plan
NPL	National Priorities List
NTCRA	Non-Time-Critical Removal Action
O&M	Operation and Maintenance
PCB	Polychlorinated Biphenyl
PDI	Pre-Design Investigation
PRG	Preliminary Remediation Goal
RAO	Remedial Action Objectives
RD	Reference Dose
SICP	Self-Implementing Cleanup Plan
SLERA	Screening Level Ecological Risk Assessment
START	Superfund Technical Assessment & Response Team
SVOC	Semivolatile Organic Compounds
TCE	Trichloroethene
TSCA	Toxic Substances Control Act
VOC	Volatile Organic Compound

Table 1: Proposed Cleanup Levels		
Contaminant	**Selected PRG**	**Basis**
Soil		
Benzo(a)pyrene	1.1 mg/kg	ILCR = 10^{-5} (1)
Dibenz(a,h)anthracene	1.1 mg/kg	ILCR = 10^{-5} (1)
2,3,7,8-TCDD TEQ	0.000048 mg/kg	ILCR = 10^{-5} (1)
Total PCBs	1 mg/kg	EPA Guidance (Human Health) (2)
	1.8 mg/kg	EqP-derived (Ecological)
Antimony	31 mg/kg	HI = 1
Arsenic	18 mg/kg	BTV (Human Health)
	68 mg/kg	Toxicity-based (Ecological)
Iron	55,000 mg/kg	HI = 1
Groundwater		
1,4-Dichlorobenzene	75 µg/L	MCL
Chloroform	80 µg/L	MCL
Trichloroethene	5 µg/L	MCL
Vinyl chloride	2 µg/L	MCL
Benzo(a)pyrene	0.2 µg/L	MCL
Bis(2-ethylhexyl)phthalate	6 µg/L	MCL
2-Methylnaphthalene	36 µg/L	HI = 1
Naphthalene (3)	2.75 µg/L	ILCR = 10^{-6}
Pentachlorophenol	1 µg/L	MCL
Dioxin TEQ	0.00003 µg/L	MCL
Total PCBs	0.5 µg/L	MCL
Arsenic	10 µg/L	MCL
Cyanide (3)	200 µg/L	HI = 1
Iron	14,000 µg/L	HI = 1
Manganese	300 µg/L	EPA Health Advisory (4)
Sediment		
Total PCBs	0.7 mg/kg	RSV
Fish Tissue (5)		
Total PCBs	0.125 mg/kg ww	ILCR = 10^{-6}

Notes:

(1) PRG basis reflects EPA risk management decision to attain balance of various Site-specific factors (e.g., uncertainty) in association with Feasibility Study detailed analysis.

(2) - For PCBs, based on A Guide on Remedial Actions at Superfund Sites With PCB Contamination, U.S. EPA Publication No. 9355.4-01FS, Fact Sheet, Aug. 1990.

(3) - Groundwater contaminant that poses risk to construction worker exposure to trench groundwater and t

(4) - EPA drinking water health advisory for manganese (EPA-822-R-04-003, January 2004) protective against concerns of potential neurological effects.

(5) - Risk-based PRG values based on 2 fish meals per month, consistent with Maine Inland Fisheries and Wildlife's Fish Consumption Advisory and "flowing water" FI.

BTV - Background Threshold Value (Site-specific)

Dioxin TEQ - 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) Toxicity Equivalent

EqP - Equilibrium Partitioning-derived

HI - Hazard Index

ILCR - Incremental Lifetime Cancer Risk

MCL - Maximum Contaminant Level (National Primary Drinking Water Regulations)

µg/L - micrograms per liter

mg/kg - milligrams per kilogram

mg/kg ww - milligrams per kilogram - weight weight

PCBs - Polychlorinated Biphenyls

RSV - Refined Screening Value (Region 4 Ecological Risk Assessment Supplemental Guidance. Scientific Support Section, Superfund Division, EPA Region 4. Originally published November 1995 and last updated March 2018.)

TEQ - Toxicity Equivalent

Table 2[1]
Comparative Analysis Summary
Keddy Mill Superfund Site
Windham, Maine

		Threshold Criteria		Balancing Criteria [2]						
		Protection of Human Health & Environment	Compliance with ARARs	Long-Term Effectiveness	Reduction through Treatment	Short-Term Effectiveness	Implement-ability	Cost		
								Capital	O&M, LTM & FYRs	Total NPV
Soil Alternatives										
SO-1	No Action	▫	▫	▫	▫	▫	●●●	$0	$0	$0
SO-2	Excavation, Off-Site Disposal, On-Site Consolidation, Capping and ICs.	■	■	●●	●	●●	●●	$9,716,000	$1,087,000	$10,803,000
SO-3	Excavation and Off-Site Disposal	■	■	●●●	●	●●●	●●	$14,113,000	$0	$14,113,000
Groundwater Alternatives										
GW-1	No Action	▫	▫	▫	▫	▫	●●●	$0	$0	$0
GW-2	Monitored Natural Attenuation (MNA) and ICs	■	■	●●	▫	●●	●●●	$83,770	$630,000	$714,000
GW-3	In-Situ Treatment, Baseline and Post-Treatment Monitoring, and ICs	■	■	●●●	●●●	●	●●	$1,573,000	$462,000	$2,035,000
Sediment Alternatives										
SED-1	No Action	▫	▫	▫	▫	▫	●●●	$0	$0	$0
SED-3A	Mechanical Excavation, On-Site Consolidation and ICs	■	■	●●	●	●●	●●	$627,000	$108,000	$735,000
SED-3B	Mechanical Excavation and Off-Site Disposal	■	■	●●●	●	●●	●●	$769,000	$91,000	$860,000

Notes:

(1) - This table is not a substitute for the detailed alternatives analysis included in the Feasibility Study. It is an evaluation summary intended to be helpful for the public

(2) - State and community acceptance will be considered following the public comment period.

FYRs - Five-Year Reviews

ICs - Institutional Controls

LTM - Long-Term Monitoring

O&M - Operation & Maintenance

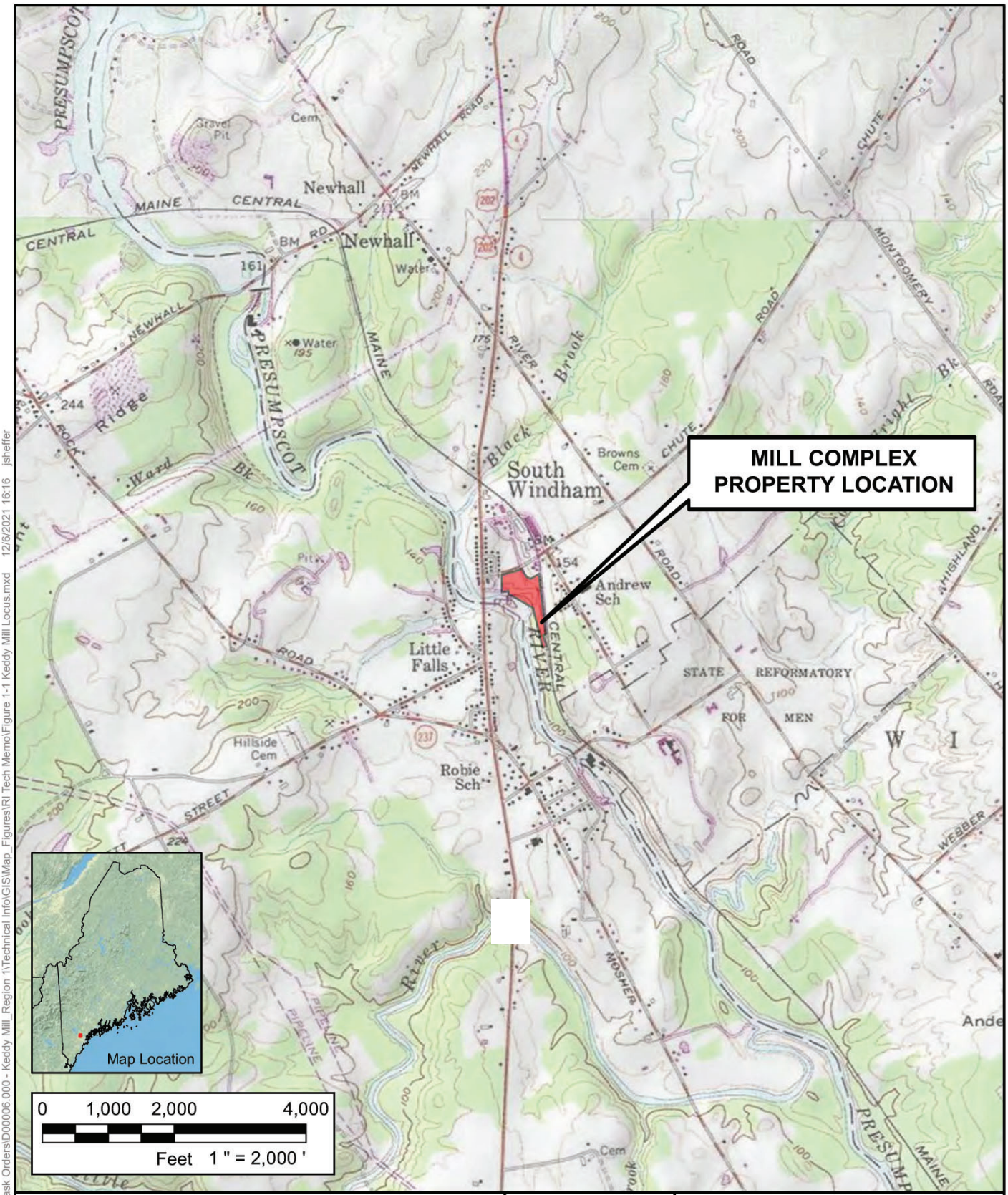
NPV - Net Present Value

▫ Fails threshold and/or balancing criterion

■ Meets threshold and/or balancing criterion

● Ranking (increasing favorability)

Shading indicates EPA's preferred alternative



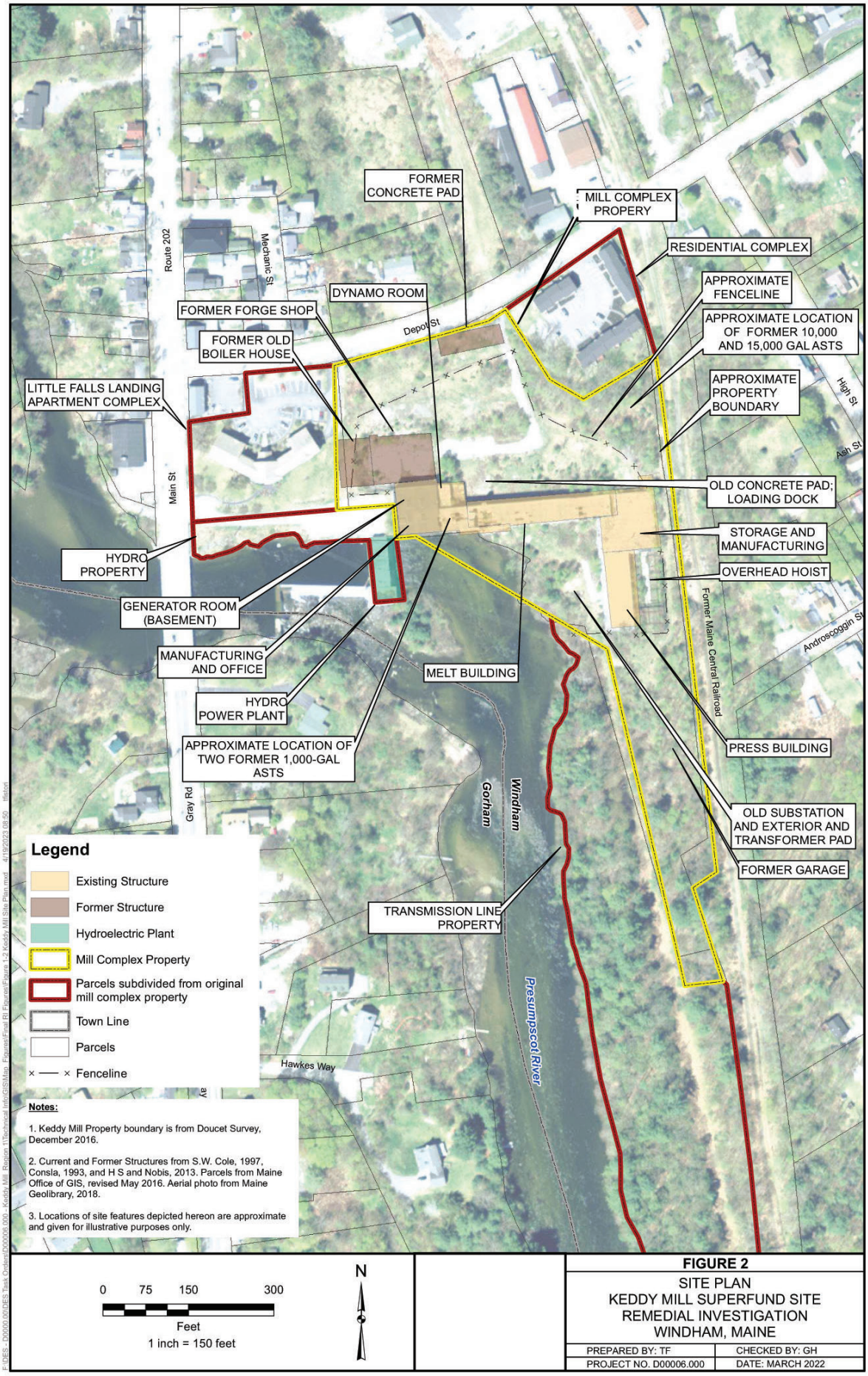
USGS Topographic Map
Gorham, Maine
Revised 1975

FIGURE 1

LOCUS MAP
KEDDY MILL SUPERFUND SITE
WINDHAM, MAINE

PREPARED BY: JTS	CHECKED BY: KKN
PROJECT NO. D00006.000	DATE: DECEMBER 2021

F:\DES - D0000.00\IDES Task Orders\D00006.000 - Keddy Mill_Region 1\Technical Info\GIS\Map_Figures\RI Tech Memo\Figure 1-1 Keddy Mill Locus.mxd 12/6/2021 16:16 jsheffer


FORMER CONCRETE PAD
MILL COMPLEX PROPERY
RESIDENTIAL COMPLEX
APPROXIMATE FENCELINE
APPROXIMATE LOCATION OF FORMER 10,000 AND 15,000 GAL ASTS
APPROXIMATE PROPERTY BOUNDARY
DYNAMO ROOM
FORMER FORGE SHOP
FORMER OLD BOILER HOUSE
LITTLE FALLS LANDING APARTMENT COMPLEX
OLD CONCRETE PAD; LOADING DOCK
STORAGE AND MANUFACTURING
OVERHEAD HOIST
HYDRO PROPERTY
GENERATOR ROOM (BASEMENT)
MANUFACTURING AND OFFICE
MELT BUILDING
HYDRO POWER PLANT
APPROXIMATE LOCATION OF TWO FORMER 1,000-GAL ASTS
PRESS BUILDING
OLD SUBSTATION AND EXTERIOR AND TRANSFORMER PAD
FORMER GARAGE
TRANSMISSION LINE PROPERTY
Route 202
Mechanic St
Depot St
Main St
High St
Ash St
Androscoggin St
Former Maine Central Railroad
Gray Rd
Gorham
Windham
Presumpscot River
Hawkes Way
Legend
Existing Structure
Former Structure
Hydroelectric Plant
Mill Complex Property
Parcels subdivided from original mill complex property
Town Line
Parcels
Fenceline
Notes:
1. Keddy Mill Property boundary is from Doucet Survey, December 2016.
2. Current and Former Structures from S.W. Cole, 1997, Consla, 1993, and H S and Nobis, 2013. Parcels from Maine Office of GIS, revised May 2016. Aerial photo from Maine Geolibrary, 2018.
3. Locations of site features depicted hereon are approximate and given for illustrative purposes only.
0 75 150 300
Feet
1 inch = 150 feet
N
FIGURE 2
SITE PLAN
KEDDY MILL SUPERFUND SITE
REMEDIAL INVESTIGATION
WINDHAM, MAINE
PREPARED BY: TF
CHECKED BY: GH
PROJECT NO. D00006.000
DATE: MARCH 2022

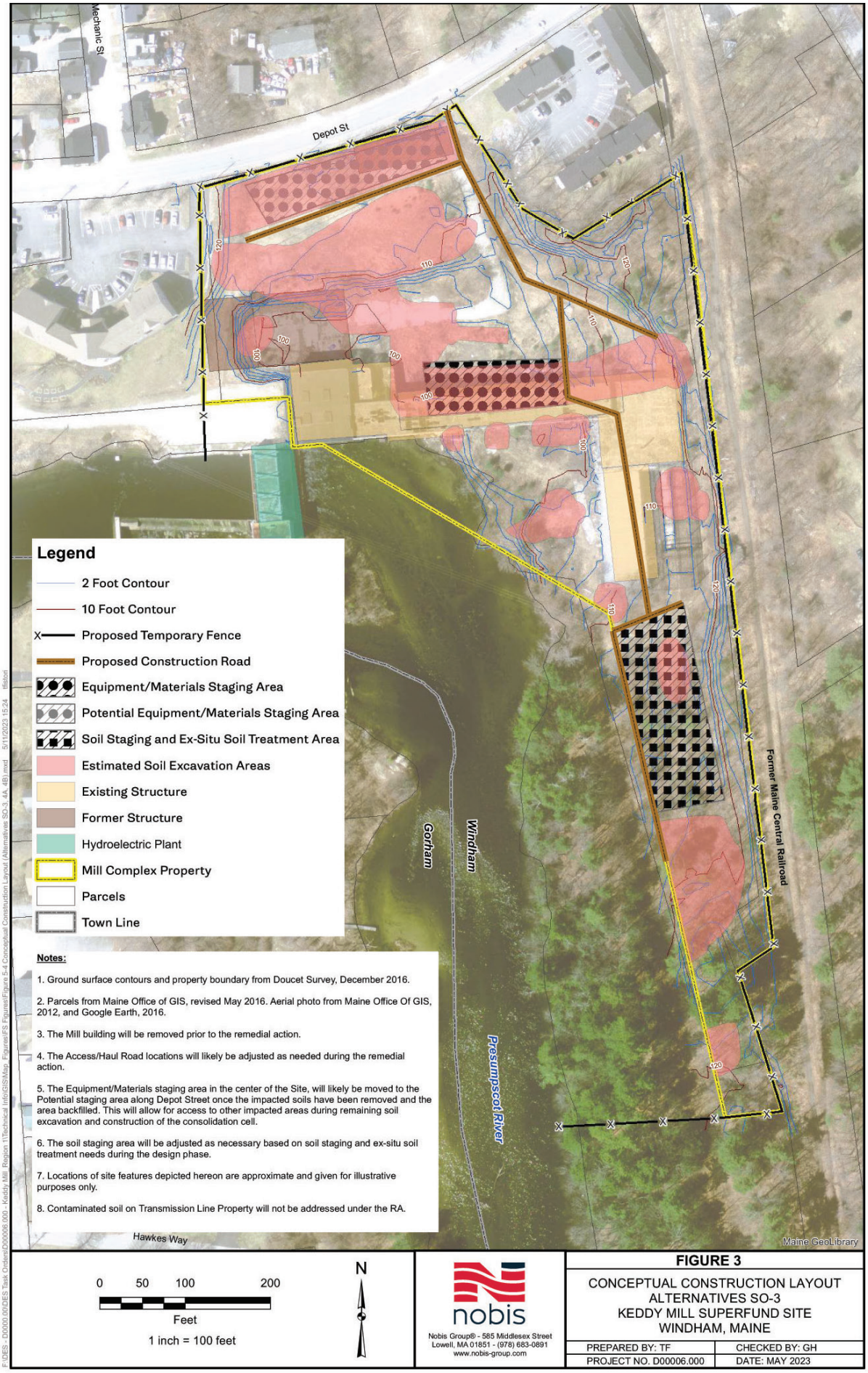

Mechanic St
Depot St
Former Maine Central Railroad
Gorham
Windham
Presumpscot River
Hawkes Way
Maine GeoLibrary
Legend
2 Foot Contour
10 Foot Contour
Proposed Temporary Fence
Proposed Construction Road
Equipment/Materials Staging Area
Potential Equipment/Materials Staging Area
Soil Staging and Ex-Situ Soil Treatment Area
Estimated Soil Excavation Areas
Existing Structure
Former Structure
Hydroelectric Plant
Mill Complex Property
Parcels
Town Line
Notes:
1. Ground surface contours and property boundary from Doucet Survey, December 2016.
2. Parcels from Maine Office of GIS, revised May 2016. Aerial photo from Maine Office Of GIS, 2012, and Google Earth, 2016.
3. The Mill building will be removed prior to the remedial action.
4. The Access/Haul Road locations will likely be adjusted as needed during the remedial action.
5. The Equipment/Materials staging area in the center of the Site, will likely be moved to the Potential staging area along Depot Street once the impacted soils have been removed and the area backfilled. This will allow for access to other impacted areas during remaining soil excavation and construction of the consolidation cell.
6. The soil staging area will be adjusted as necessary based on soil staging and ex-situ soil treatment needs during the design phase.
7. Locations of site features depicted hereon are approximate and given for illustrative purposes only.
8. Contaminated soil on Transmission Line Property will not be addressed under the RA.
0 50 100 200
Feet
1 inch = 100 feet
N
nobis
Nobis Group® - 585 Middlesex Street
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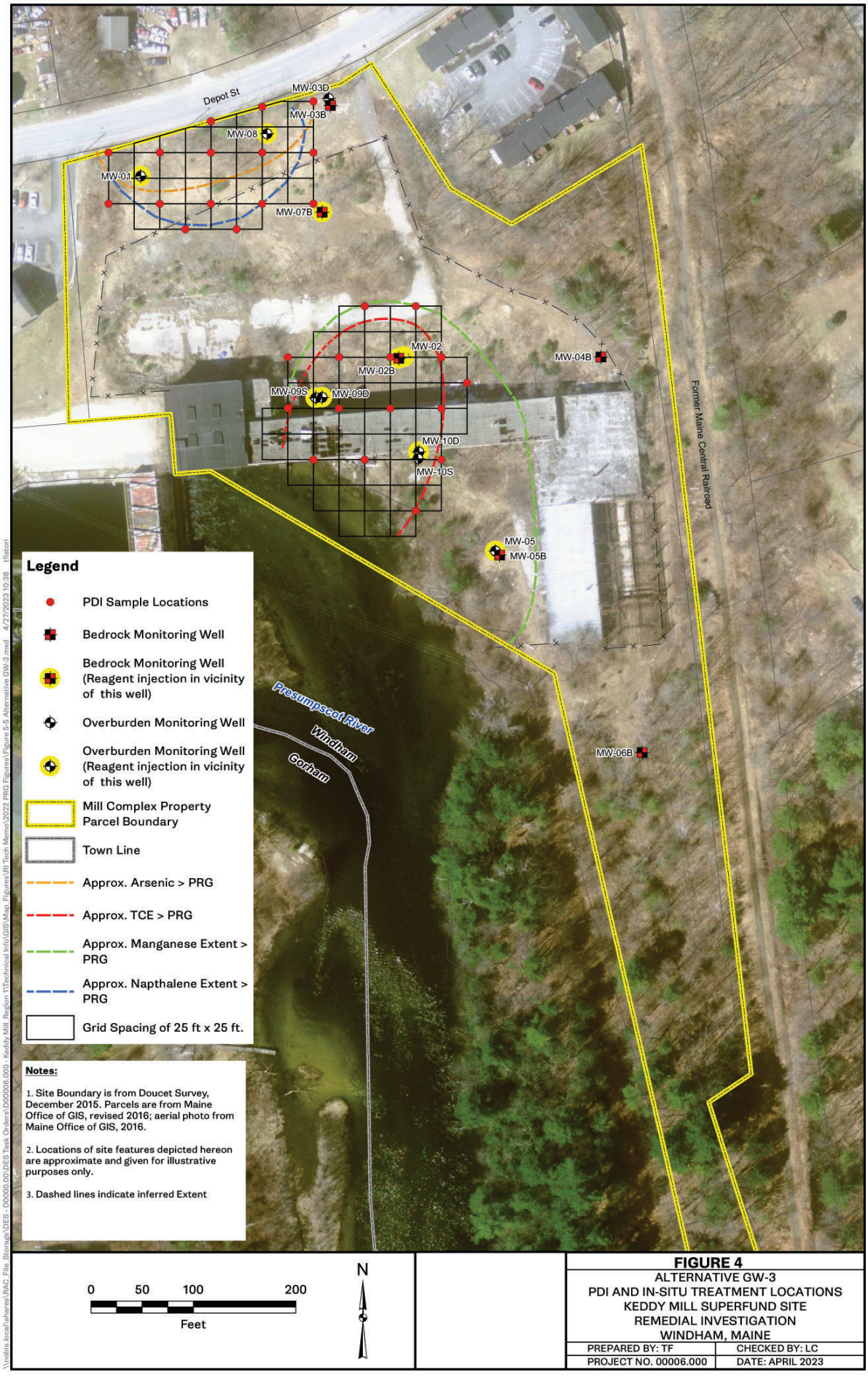
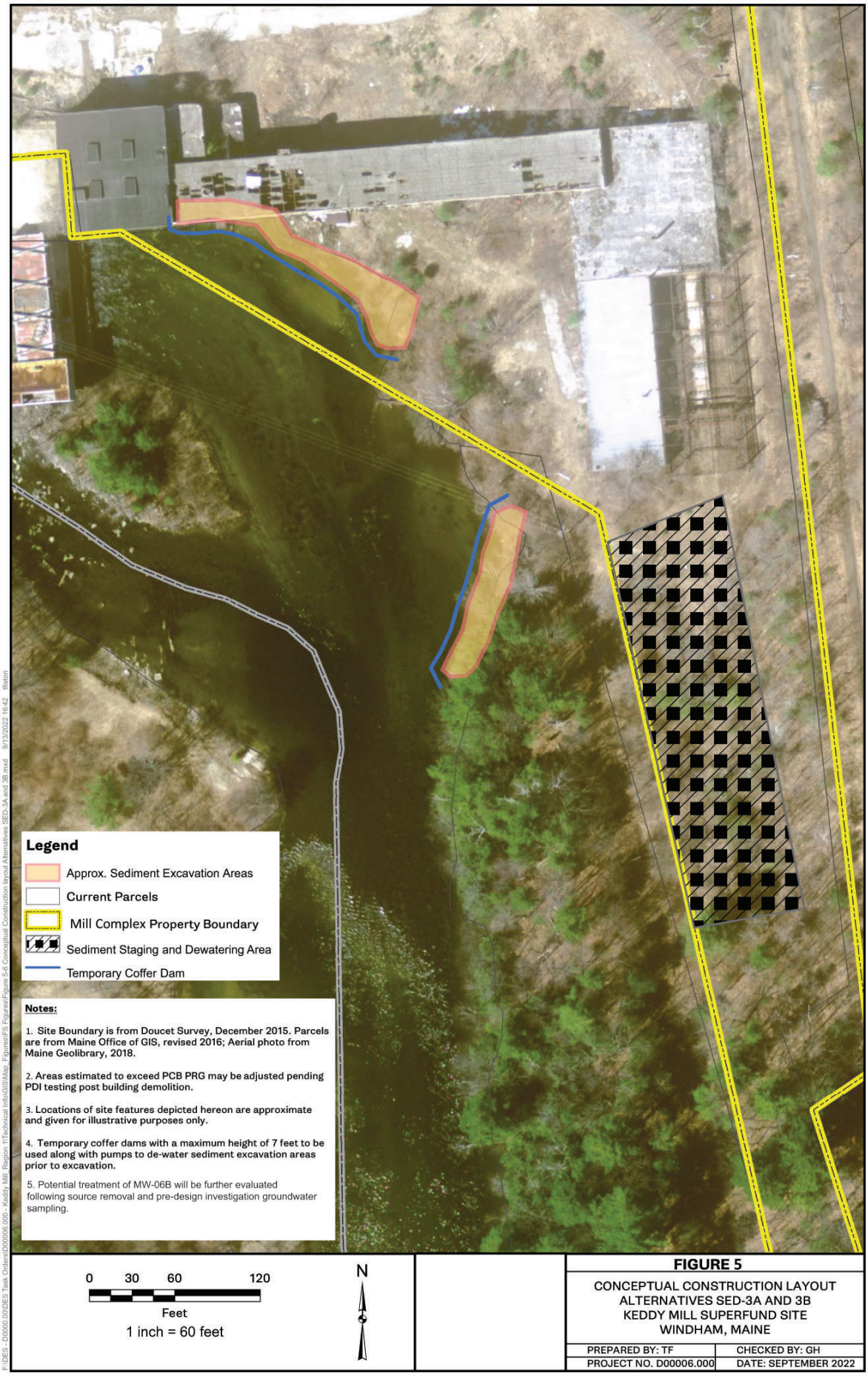
FIGURE 3
CONCEPTUAL CONSTRUCTION LAYOUT
ALTERNATIVES SO-3
KEDDY MILL SUPERFUND SITE
WINDHAM, MAINE
PREPARED BY: TF
CHECKED BY: GH
PROJECT NO. D00006.000
DATE: MAY 2023
F:\DES - D0000.00\DES Task Orders\D00006.000 - Keddy Mill, Region 1\Technical Info\GIS\Map Figures\FS Figures\Figure 5-4 Conceptual Construction Layout (Alternatives SO-3, 4A, 4B).mxd 5/11/2023 15:24 tfistori


Depot St
MW-03D
MW-03B
MW-08
MW-01
MW-07B
MW-02
MW-02B
MW-09S
MW-09D
MW-10D
MW-10S
MW-04B
MW-05
MW-05B
MW-06B
Former Maine Central Railroad
Presumpscot River
Windham
Gorham
Legend
PDI Sample Locations
Bedrock Monitoring Well
Bedrock Monitoring Well (Reagent injection in vicinity of this well)
Overburden Monitoring Well
Overburden Monitoring Well (Reagent injection in vicinity of this well)
Mill Complex Property Parcel Boundary
Town Line
Approx. Arsenic > PRG
Approx. TCE > PRG
Approx. Manganese Extent > PRG
Approx. Napthalene Extent > PRG
Grid Spacing of 25 ft x 25 ft.
Notes:
1. Site Boundary is from Doucet Survey, December 2015. Parcels are from Maine Office of GIS, revised 2016; aerial photo from Maine Office of GIS, 2016.
2. Locations of site features depicted hereon are approximate and given for illustrative purposes only.
3. Dashed lines indicate inferred Extent
0
50
100
200
Feet
N
FIGURE 4
ALTERNATIVE GW-3
PDI AND IN-SITU TREATMENT LOCATIONS
KEDDY MILL SUPERFUND SITE
REMEDIAL INVESTIGATION
WINDHAM, MAINE
PREPARED BY: TF
CHECKED BY: LC
PROJECT NO. 00006.000
DATE: APRIL 2023


Legend
Approx. Sediment Excavation Areas
Current Parcels
Mill Complex Property Boundary
Sediment Staging and Dewatering Area
Temporary Coffer Dam
Notes:
1. Site Boundary is from Doucet Survey, December 2015. Parcels are from Maine Office of GIS, revised 2016; Aerial photo from Maine Geolibrary, 2018.
2. Areas estimated to exceed PCB PRG may be adjusted pending PDI testing post building demolition.
3. Locations of site features depicted hereon are approximate and given for illustrative purposes only.
4. Temporary coffer dams with a maximum height of 7 feet to be used along with pumps to de-water sediment excavation areas prior to excavation.
5. Potential treatment of MW-06B will be further evaluated following source removal and pre-design investigation groundwater sampling.
0 30 60 120
Feet
1 inch = 60 feet
N
FIGURE 5
CONCEPTUAL CONSTRUCTION LAYOUT
ALTERNATIVES SED-3A AND 3B
KEDDY MILL SUPERFUND SITE
WINDHAM, MAINE
PREPARED BY: TF
CHECKED BY: GH
PROJECT NO. D00006.000
DATE: SEPTEMBER 2022